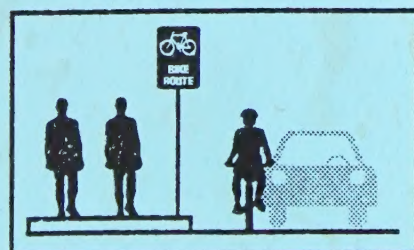
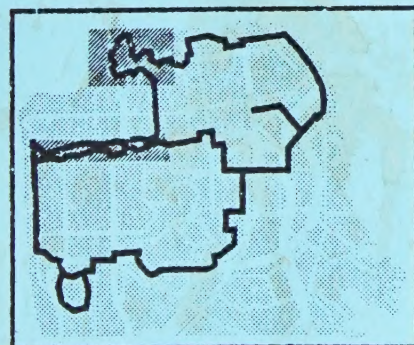
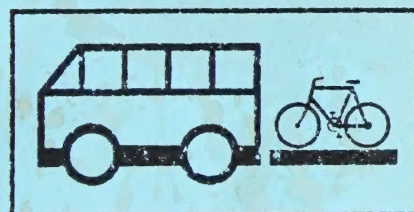
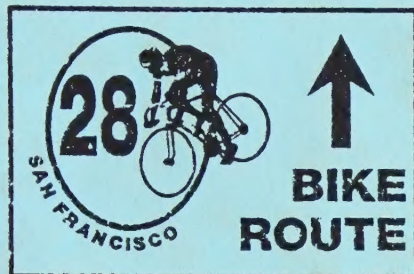
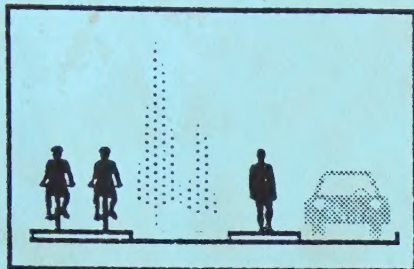


DRAFT REPORT



San Francisco Bicycle Plan

prepared for



DEPARTMENT OF PARKING AND TRAFFIC
City and County of **SAN FRANCISCO**

prepared by
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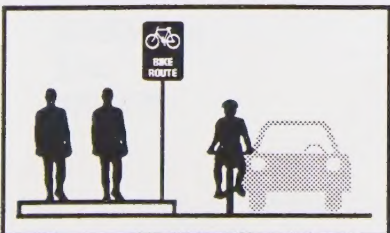
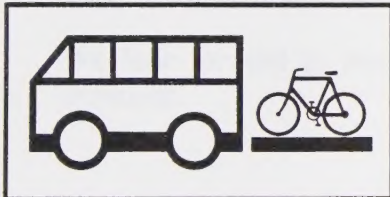
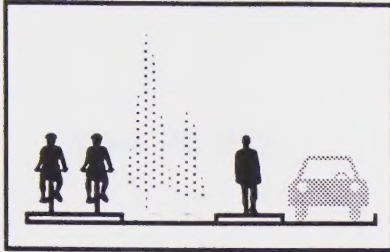
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San Francisco Bicycle Plan

prepared for



DEPARTMENT OF PARKING AND TRAFFIC
City and County of SAN FRANCISCO

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March 30, 1995

Mr. Peter Tannen
Department of Parking Traffic
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Re: San Francisco Bicycle Plan

Dear Mr. Tannen:

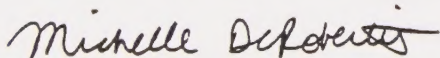
Wilbur Smith Associates is pleased to present the Draft San Francisco Bicycle Plan to the City and County of San Francisco for review and comment. This report reflects comments from the Department of Parking and Traffic and from the public to date.

We have enjoyed working with you on this project. We also welcome working with you and other City departments to affect the changes necessary to make the City and County of San Francisco a truly bicycle-friendly city.

We look forward to incorporating future comments into the Final Report. Please call with any questions.

Very truly yours,

WILBUR SMITH ASSOCIATES



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#291370



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The consultant also wishes to acknowledge **Marilyn Smulyan** of the San Francisco Bicycle Advisory Committee and **Dave Snyder** of the San Francisco Bicycle Coalition for their advice and helpful suggestions throughout all phases of this study. In addition, we would also like to acknowledge **Peter Tannen** for his role in writing some of the transit and funding sections of this report.

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FINDINGS AND RECOMMENDATIONS

INTRODUCTION

The San Francisco Bicycle Plan ("Bicycle Plan") presents a guideline for the City to provide the safe and attractive environment needed to promote bicycling as an alternative transportation mode.

Bicycling is a pollution-free, economical and healthy alternative transportation mode for many recreational, work and shopping trips in San Francisco and between San Francisco and other Bay Area locations. The City has an almost ideal climate for bicycling: temperate, without ice or snow and with a long dry season. It is home to a large and active bicycle population with a Bicycle Advisory Committee (SFBAC) appointed by the Board of Supervisors and a Bicycle Coalition (SFBC), an advocacy group. The limited supply and high cost of parking as well as traffic congestion and the City's compactness make bicycling an attractive option for many.

The City's topography, level of development, and high traffic volumes provide the greatest challenge to providing a safe environment for bicyclists. There are a limited number of flat or even relatively flat through routes in the City and bicycles must compete for space on these streets with automobiles and the City's extensive transit system.

The report presents a comprehensive review of the many aspects of the policies, procedures, practices and physical infrastructure of the City that affect bicycling. It recommends ways to make bicycling safer and more convenient through a variety of efforts including street improvements, bicycle parking facilities, new city policies, education programs, promotional efforts and transit access.

Further study will often be required before the projects can be fully implemented. In total, these recommendations will ensure that bicycling is treated as a serious transportation mode in the City.

The various aspects of the bicycle plan were analyzed in substantial detail in the study and are presented in subsequent chapters of the report. This section of the report summarizes the principal findings and recommendations of the study and is organized as follows:

- ▶ Goals and Objectives
- ▶ Recommended Bicycle Network
- ▶ Recreational Element
- ▶ Organizational Changes
- ▶ Funding for Bicycle Projects
- ▶ Design Standards
- ▶ Maintenance
- ▶ Traffic Calming
- ▶ Parking
- ▶ Transit Access

- ▶ City Ordinances and Policies
- ▶ Safety: Education and Enforcement
- ▶ Promotion of Bicycling

It is acknowledged that many of these recommendations will need to be phased due to funding constraints.

GOALS AND OBJECTIVES

The goal of the Bicycle Plan is to provide a comprehensive guide for efforts that will make San Francisco a more "bicycle-friendly" city. Within that overall goal are a number of objectives that were developed during the course of the study by the City, SFBAC, SFBC and the consultants:

1. Improve Facilities for Bicyclists

- ▶ Provide a comprehensive network of signed and mapped routes for bicyclists and provide improvements that expedite travel and improve safety along these routes.⁽¹⁾
- ▶ Increase the number of secure parking areas for bicycles.
- ▶ Provide for uniform markings and design standards.
- ▶ Improve access to transit modes and over bridges.
- ▶ Improve maintenance of streets and bikeways.¹

2. Improve Bicycle Safety

- ▶ Provide safer facilities.
- ▶ Educate bicyclists and motorists on regulations, rules of the road and safe sharing of the roads.
- ▶ Increase enforcement of bicycle-related violations on the part of both motorists and bicyclists.

3. Promote Bicycling in the City

- ▶ Increase bicycle use as an alternative to the auto.
- ▶ Encourage bicycle use by potential cyclists.
- ▶ Encourage bicycle use by visitors to the City.

4. Increase Bicycle Funding

- ▶ Establish priorities for project funding.
- ▶ Match projects and funding sources.
- ▶ Identify new funding sources.

⁽¹⁾ The establishment and signing of routes will not in any way preclude or discourage the maintenance or improvement of other streets.

RECOMMENDED BICYCLE NETWORK

A system of bicycle routes was developed to (1) incorporate in the City's Master Plan (2) be used for maps that will be made available to bicyclists throughout the City and (3) to help prioritize investment in route facilities. Three general principles were followed in identifying these routes:

1. Provide the quickest and most direct way to travel by bicycle in the City.
2. Attract bicyclists who are intimidated by traffic, steep hills and other potential deterrents.
3. Serve major attractions and every City neighborhood with the most direct and safe bicycle routes.

No overt distinction has been made in the recommended bicycle network between commute routes and recreational routes. Many routes which may seem to be primarily recreational are also used by commuters.

The recommended routes were put in five categories, expanding on the standard three classifications identified in the California Highway Design Manual (HDM) to provide more information about the specific types of improvements:

- Class I = Off-street path
- Class II = Bicycle lane
- BPS/TC = Bicycle priority street through traffic calming
- Wide Curb Lanes = Bicycle route with wide curb lanes
- Class III = Signed Bicycle route - improvements vary

The recommendations provided in the Bicycle Plan are considered the minimum necessary to enable bicyclists to safely circulate throughout the City. In some instances, restriping is recommended to provide wide curb lanes. Bicycle lanes can sometimes be provided by merely laying down a bicycle lane in an existing curb lane while in some instances, restriping is necessary to have enough curb lane width for a bicycle lane. In a few instances, the number of travel lanes must be reduced in order to provide a bicycle lane. A reduction in travel lanes has been recommended where no other options can be developed to provide safety and mobility for bicyclists. The most significant improvement projects are listed below.

- **Broadway Tunnel** - Widen sidewalk in westbound tunnel, widen curb lane in eastbound tunnel, install bicycle-actuated flashing beacon for eastbound tunnel warning motorists of the presence of a bicyclist in the tunnel.
- **Bayshore Boulevard/Army Street/Highway 101 Interchange** - Construct bicycle path from existing path paralleling Army Street to connect to southbound Bayshore Boulevard.

- **Marina Boulevard** - Widen junction where existing bicycle path intersects Beach Street/Laguna Street. Divide existing sidewalk into two sections: a pedestrian sidewalk and a parallel adjacent bicycle path.
- **Oak Street between Baker and Scott** - Remove parking on north side, provide 2-way bicycle path adjacent to sidewalk. Provide left-turn phasing for motorists and bicycles-only signal phasing.
- **Fell/Masonic** - Remove parking on south side for 200 feet to provide left-turn lane; provide left-turn phasing for motorists and bicycles-only signal phase.
- **Fell/Stanyan** - Provide bicycles-only signal phase, improvement of bicycle paths on west approach, and other improvements recommended in Golden Gate Park Master Plan.
- **Kezar Street** - Construct bicycle path along east side of Kezar Street from J.F. Kennedy Drive to Lincoln Street.
- **Stern Grove** - Construct bicycle path along outside edge of Stern Grove from 20th Avenue on north side to 21st Avenue on south side.
- **19th Avenue between Buckingham Way and San Francisco State University** - Remove parking for the equivalent of one block and provide 2-way bicycle path on west side of 19th Avenue.
- **Islais Creek** - Construct bicycle/pedestrian bridge over Islais Creek.
- Install traffic signals at selected intersections to enable bicycles to safely cross major streets along designated bicycle routes.

A bicycle route signage program is critical to the successful implementation of the City's bicycle route network. Bicycle route signs, like highway signs, must be consistent throughout the system and easily recognizable to the bicyclist and motorist alike by using a unique logo or other identifying symbol. At a minimum, the bicycle route signs should include the identifying logo, the route number (if a numbering system is being used) and the direction of travel. Signs for regional routes that coincide with City routes should accompany the City signage along the route segments that are shared.

RECREATIONAL ELEMENT

The focus of the recreational element was on the following areas:

- ▶ Family-oriented routes and learning areas
- ▶ Scenic bicycle loop
- ▶ Requirements for major facilities

Youth and Family

Learning facilities are recommended in Golden Gate Park, Lake Merced, McLaren Park, Candlestick Trail Shoreline Park (on days when there are no games), the Presidio (one site off Lincoln and a second on Crissy Field) and Mission Bay (at China Basin). Access to these areas is recommended by utilizing proposed bikeway routes.

Scenic Bicycle Loop

An important component of the overall recreational element is the proposed scenic bicycle loop. The loop would have three purposes:

1. To encourage local bicyclists to do more recreational riding in the City.
2. To promote San Francisco as a destination for tourists interested in bicycling and to relieve traffic congestion and parking problems at tourist destinations.
3. To encourage tourists to venture beyond the traditional sightseeing spots of San Francisco.

The idea behind the scenic bicycle loop is similar to the existing 49-mile scenic auto loop. It would be signed as a special bicycle route and could be promoted by the San Francisco Convention and Visitors Bureau (SFCVB) and probably by retail bicycle shops in the City. Funding could come from the SFCVB and the advertising of bicycle shops and bicycle equipment on a map. It could also be combined with a map that shows recommended walking tours and could be sold in stores.

It is certain that the exact alignment of the route will change as the route is developed with input from the bicycling community and the SFCVB. It is envisioned that the route will be designed as a self-guided tour, so riders can choose the length of the route that suits their time frame and physical ability.

It is recommended that the published map indicate:

- ▶ Points of interest (museums, historic sites, etc.)
- ▶ Scenic overlooks
- ▶ Grades of greater than 5 percent
- ▶ Bicycle repair shops
- ▶ Neighborhoods
- ▶ Bicycle parking facilities

Recommendations for Future Planning Efforts

Major new developments and re-development areas—such as Mission Bay, Embarcadero, etc.—should have a dedicated bicycle element as part of their circulation/open space plan. These elements should also indicate connections with the total bikeway system. It is recommended that the City work with the Port of San Francisco and the National Park Service to develop a long-term plan for a waterfront bicycle path the full length of the waterfront from Hunters Point to the Golden Gate Bridge and along the ocean front to Fort Funston.

FUNDING FOR BICYCLE PROJECTS

Traditional Funding Sources

The City and County of San Francisco, unlike other major U.S. cities, does not currently budget any funds for bicycle programs or projects, except a small portion of the local one-half cent transportation sales tax. Other available sources can only be used for bicycle projects under very specific conditions and/or with other projects. These local, regional, state and federal funding sources are listed in Chapter 4 of the report.

Each source of funds is limited to certain projects and has its own unique application forms and procedures requiring considerable time to prepare grant applications. Although the Bicycle Coordinator has been successful in every grant application filed, the amount of potentially available traditional funds is severely limited by the small amount of time available to the Bicycle Coordinator (who has no staff) to apply for these funds.

The following grants have been obtained by San Francisco in the past two years:

- SF Transportation Authority Proposition B One-half Cent Sales Tax: Bicycle Plan and Spot Improvement Program.
- Bay Area Air Quality Management District (AB434): Bicycle lockers for both of two funding cycles.

- Transportation Development Act (TDA Article 3): Various projects.
- Proposition 116 Rail Bonds: Curb lane widening in various locations; Valencia Street median removal and curb lane widening; Commute route signage.
- Intermodal Surface Transportation Efficiency Act (ISTEA) - Surface Transportation Program (STP): Lake Merced Boulevard median relocation and curb lane widening.
- Office of Traffic Safety (OTS) - Registration and travel expenses for two bicycle facilities planning courses.

Non-Traditional Funding

Grant and Foundation Opportunities - Given adequate staff support, or through citizen volunteer efforts, it is recommended that a variety of three page proposals be prepared for selected San Francisco based foundations (identified in Chapter 4 of the report). For those organizations that provide funds primarily for youth related activities, the letters of intent should be tailored to the children's bicycle safety program and perhaps a free children's helmet campaign for low income areas of the City. For those foundations focused upon the arts, recommendations should also include art related elements.

Development of Mutual Interest Alliances - It is recommended that the City pursue key alliances to enhance the immediate opportunities available for non-traditional funding. These potential alliances include:

1. **San Francisco Convention and Visitors Bureau (SFCVB).** By working with the SFCVB, the San Francisco Bicycle Coalition, San Francisco Bicycle Advisory Committee and/or the City could possibly acquire meeting planner support for the development of a potential bid for holding the 1998 or 2000 Pro-Bike/Pro-Walk Conference in San Francisco. Support in the selection of a conference site and potential contributors to the conference itself might also result from this effort.

SFCVB could be involved in development of the scenic bicycle route map. Profits from such a map could then be used to support bicycle education and safety programs and perhaps add additional staff to the Bicycle Coordinator's Office (currently a one-person function).

2. **Selected Corporate Sponsors.** In exchange for exclusive advertising rights to public announcements, t-shirts, signage and event logos, selected sponsors can support various bicycle events or programs. Recommendations for the San Francisco program might include the Levi Strauss Company, Nike, Gap, and, the Bank of America.
3. **National Park System/Golden Gate National Recreation Area.** Many of the concepts recommended in this report would be enhanced if coordinated with representatives of the park system.

Funding From Large Employers/Developers - The key to implementing a bicycle support program for new development or redeveloped sites is to either require the bicycle improvements, as part of the City's review process, or provide financial incentives to encourage their installation. Specific recommendations might include:

1. Requiring building management/leasing companies to provide secure bicycle parking facilities (see section on "parking").
2. Providing transportation allowances for employees that bicycle or walk to work. This allowance should equal the current subsidy that employers can receive for transit passes.
3. Initiating a tax incentive structure for those employers that provide facilities for employees that bicycle to work.
4. Allocating money for a Bicycle Fund for those developers required to contribute to infrastructure improvements as part of their building permit or zoning change. Although specific bicycle related roadway infrastructure may not be required immediately adjacent to the new development, this fund could provide an overall bicycle path/lane system that could be accessed by employees of the newly developed site.

Utility Relocation Improvements/Requirements - Recommendations regarding the improvement of street surfaces or the striping of future bicycle lanes should be coordinated with the local, private utility companies. In the State of Washington, utility companies have worked with local bicycle planners to coordinate their utility system maintenance program with specific bicycle lane striping projects.

National Office of Transportation Safety - Both the national and state offices of safety maintain potential grant funding programs for bicycle safety. The National Transportation Safety Board provides educational funds to selected programs on a grant submittal basis. Although bicycle operations are not a large portion of the office's focus, there has been interest in maintaining and promoting children's helmet ordinances.

Adopt-A-Trail/Path Programs - Modeled upon the Southern California program of highway maintenance contributions, this program would post signs to indicate which individual or group has contributed to the either the development, installation or maintenance of a particular bicycle facility.

Memorial Funds - These programs are advertised as potential donor projects to be funded via on-going charitable contributions or funds left to a particular project through a will. Most memorial projects include the location of a memorial plaque at a location specific to the improvement or a scenic vista points.

Revenue Producing Operations - As part of the development of a trail or bicycle path, plans can specifically include the location of a revenue producing operation adjacent to the proposed improvement. Bicycle rental facilities, food and drink establishments, bicycle storage facilities and equipment centers, and/or equestrian centers, would be appropriate uses. The on-going lease revenues from these operations could be used for trail/path maintenance.

ORGANIZATIONAL CHANGES

The Bicycle Plan outlines many activities, including planning, implementation, project management, grant writing, and construction, that require involvement of the Bicycle Coordinator. Since these activities stretch over a wide range of disciplines, as common to many other city bicycle programs, but require coordination, a bicycle "group" of staff to administer the bicycle program is recommended. The staff should have the various skills required for implementing the bicycle program, although it is not necessary to have each staff member skilled in all areas.

To strengthen the role of the bicycle program within the transportation arena of the City, a core of bicycle staff within a department, working with other departments, should be established. The Bicycle Coordinator would manage staff and activities. Reviews of other cities indicate that bicycle activities are managed from the transportation or traffic divisions. So, it is recommended that the City's Department of Parking and Traffic (DPT) continue to house the coordination of bicycle activities by having the bicycle division as part of DPT.⁽²⁾

⁽²⁾ In the future, DPT may become part of the newly established Public Transportation Commission and the bicycle staff could become a division directly under the Commission.

The following recommendations for staffing were based on the extent of activities outlined in the Bicycle Plan:

- The Bicycle Coordinator should be a supervisory position, Transit Planner III or higher. The Coordinator would manage bicycle projects, be responsible for coordinating activities with other departments, and seek funding. The Bicycle Coordinator would also manage the staff within the bicycle group.
- Other staff would be a full-time Planner position, a part-time Traffic Engineer and a part-time Management Assistant to add up to two full-time equivalent employees.
 - ▶ The Planner would be a Transit Planner I or II position. The Planner would manage small bicycle projects such as implementation of traffic-calming measures. The Planner would also participate in planning, education, and enforcement activities, as necessary, and provide day-to-day support to the Bicycle Coordinator
 - ▶ The Engineer would be a Traffic Engineer I or II position. The Engineer would review project plans for bicycle-related concerns, manage bicycle-related maintenance, signage, and traffic activities, and coordinate with departments for the Spot improvement program. The Engineer would also provide support to the Bicycle Coordinator.
 - ▶ The Management Assistant would provide grant-writing assistance to the Bicycle Coordinator. There are significant resources for securing funding for a variety of bicycle-related projects that currently can not be sought due to staff and time constraints. The Management Assistant would work with the Bicycle Coordinator and other departments to produce applications for funding. For example, the Management Assistant could work with the City's Department of Health to gather input for compiling a grant application for bicycle safety training.
- The bicycle division positions should be 75 percent project-funded and 25 percent general funds. The project-funded goal would allow for expansion of staff as needed.

DESIGN STANDARDS

Bicycle Paths

An eight foot cross section is adequate for a bicycle path of any length where few pedestrians are expected. However, this situation occurs very infrequently in San Francisco so that most bicycle paths are essentially multi-use trails, and should be designed to more than minimum standards. For paths with low pedestrian volumes, (approximately 50-100 per peak hour) minimum paved width is recommended to be 10 feet. For moderate pedestrian volumes (approximately 100-400 per peak hour) the recommended paved width should be between 12 and 16 feet. For heavy pedestrian volumes (greater than approximately 400 per peak hour), two parallel facilities are recommended: one for faster traffic, such as bicycles and roller blades, and one for slower modes such as pedestrians, children on training wheels etc.

To increase motorists' awareness that bicycle traffic is crossing a street, pavement for the bicycle's path across the intersection should be designed as an eight-foot band of distinctive color.

Bicycle Lanes

For safety reasons, the minimum bicycle lane width specified in the HDM of four feet (five feet with parking) should not be applied to streets with high traffic volume and speed. On streets with over 500 vehicles per hour per lane (VPHPL) and/or speeds of 35 mph or more, the goal should be bicycle lanes of six to eight feet in width. Double parking in bicycle lanes, particularly wide bicycle lanes, is a serious concern in some areas, and is addressed in more detail in Chapter 8 of the report.

Class III Bicycle Routes and Wide Curb Lanes

It is recommended that a pavement stencil be used in the right-hand portion of the lane. This stencil should be supplemented with **"Share the Road"** signs for lane widths of 12 to 14 feet and with **"Bicycles Allowed Use of Full Lane"** for lane widths 11 feet or less. It is recommended that these signs and pavement stencils be used on designated bikeways and other roadways with heavy traffic volumes and narrow lanes i.e. more than 600 vphpl and curb lane widths of 14 feet or less (22' or less with parking).

When paved street surfaces are interspersed by utility hole covers or drainage grates, it is important that the seam between asphalt roadways and the concrete gutter or other obstacles be set flush with the paved roadway. The HDM specifies that a step between the pavement and obstruction be less than 3/4 of an inch perpendicular to travel, and 3/8 inch parallel to travel. Ideally, whether perpendicular or parallel to travel, the allowable tolerance in roadway surface should be within 1/16 of an inch.

Rumble Strips

Raised ceramic markers installed as rumble strips should not be installed to the edge of the travelled way but should leave a clear space of 12 to 18 inches through which bicycles may travel. A center strip clear of markers is also recommended.

Implementation

At the very least, the improvements discussed herein should be implemented when a street is resurfaced or reconstructed (every 15 to 25 years). It is recommended that the City adopt a procedure to identify locations that are in need of redesign through the existing Spot Improvement Program (see next section). A dedicated annual budget for such improvements for the Spot program would ensure progress in providing safer streets in San Francisco and help the city defend itself in potential liability cases.

The design guidelines that have been recommended as part of the San Francisco Bicycle Study can only benefit the City and its residents if they are implemented. The key to a successful implementation strategy, as evidenced by the experience of other cities, has been the routinization of bicycle planning considerations in the on-going planning and design phases of a capital construction project. In particular, the inclusion of bicycle design standards must be at a phase sufficiently early in the project's development that there are no adverse cost implications that might curtail their inclusion.

Based on the recommendations that have been put forth as "Recommended Design Standards", the following recommendations are suggested as implementation guidelines. Recommendations include quarterly review meetings with City representatives responsible for capital construction projects, the development of a bicycle design standards summary brochure, the computerization of recommended design standard elements, the coordination of design recommendations with the City's on-going curb cut program, pavement system management program, redevelopment district planning, transit preferential/pedestrian streets, and the signal replacement program.

MAINTENANCE

Procedures

In 1993, a "Spot" Bicycle Improvement Program was initiated to identify and implement various bicycle-related improvements. This program is handled by the City's bicycle coordinator in the Department of Parking and Traffic (DPT). Problems are identified through mail-in postcards which are distributed to various bicycle organizations in the City. The postcards received by mail are logged into a data base and sorted by type of repair requested. The repair work is then

accomplished by the DPT or Department of Public Works (DPW), with DPT as the lead department.

A more systematic inventory of street safety improvements for bicyclists is recommended since many safety related improvements remain unreported through the pilot Spot Improvement Program and other sources. Adequate budget for staffing to coordinate policies, priorities and remedial activities with follow-up is needed to make the program effective.

Standards

Street Cut Improvements

- Open street cuts should be identified with barriers or covered with two inches of asphalt on top of the dirt from the gouge.
- Street cuts should be flush to the adjacent surface.
- Steel plates used to cover work in progress should have no-skid surfaces and either have beveled edges or be built up all sides with asphalt.
- Heat resistant concrete pads of at least a three-foot radius from the edge of the utility hole cover should be used to prevent warping of the asphalt near the edges. If possible, concrete should be installed above submerged steam pipes where applicable, to prevent humping of street surface.

Paving, Patching

- Asphalt pavement replacement must be flush with surrounding pavement, including adjacent concrete gutter. It must be inspected up to one year after installation to check for settling, and be replaced if defective. The City should put legislation in place to require that utility companies and private contractors replace defective pavement for up to one year after installation at no cost to the City (as is done in Palo Alto).
- Fresh loose asphalt materials should be swept off the shoulder before they have a chance to adhere to the shoulder pavement.
- Shoulder blade patching should cover the entire shoulder width, and smoother grader tires should be used, or the shoulder area should be well-rolled after the last pass of the grader.

Striping, Pavement Legends and Edge Line Markings

- Non-skid surfaces should be employed on all traffic lane lines. The use of pavement marking tape for bicycle lane legends increases safety as it is less slippery, and much thinner than thermoplastic.
- Edge lines should not be supplemented with raised pavement markers which present obstacles for bicyclists. Where edgeline raised reflectors are needed for motorists, they should be installed on the motorists' side of the edge line.

Roadway and Shoulder Sweeping

- A minimum weekly sweeping schedule should be maintained in addition to sweeping bikeways whenever there is an accumulation of gravel, glass, sand or other materials on the bikeway.

Catch Basin Grates/Utility Covers

- Street, sewer and storm drainage grates should be oriented so that the bars are perpendicular to the direction of travel, to create bicycle-safe grates. Low catch basin grates should be raised to the proper pavement elevation to improve bicycle safety and enhance smooth riding.
- Utility covers must be flush with surrounding pavement.
- Regular inspection of curb and gutter should identify those that are raised, sunken or that have some vertical differential that would cause ponding, and these should be repaired.
- Small asphalt dams to divert storm water into catch basins should not be constructed on shoulder bikeways.

Railroad Tracks

- Where possible, abandoned railroad tracks should be removed to improve safety conditions for bicyclists. Those still in use should be made safer by installing rubberized surfaces adjacent to the tracks. It is recommended that all railroad tracks across which a bicyclist would travel, i.e., in all intersections, receive such treatment. Highest priority should be given to tracks that cross cyclists' travel direction at a diagonal.

Bicycle Pathway Maintenance System

- A Bicycle Pathway and/or Pavement Maintenance System should be a part of a computer database which can provide reports on the current condition of every bicycle lane or pathway in the City. This should be kept updated through regular street condition surveys. A computerized system will permit identification of priority maintenance needs throughout the City.
- A signing/lighting plan is needed for all maintenance activities on the City's bicycle paths and bicycle lanes. Advance warning of maintenance work and designation of a detour route should be made.

TRAFFIC CALMING

Traffic Calming is the term applied to a variety of physical measures intended to reduce the dominance of automobile and truck traffic in urban areas. Traffic calming does not attempt to ban the automobile, but primarily to reduce the speed of automobile traffic or to reduce the amount of non-local traffic on the street. It benefits the neighborhood by reducing the ill-effects of automobile traffic such as noise and pollution, while improving safety and ambiance. Any implementation strategy should involve the affected neighborhood closely, as described in Chapter 6.

Bicycle Priority Streets

Bicycle priority streets or bicycle boulevards can provide a more comfortable alternative to busy streets and can be created on residential streets on which bicycle paths and bicycle lanes are unsuitable. They provide two advantages that do not exist in the current street network:

1. A low traffic volume alternative where bicycles and motor vehicles can share the roadway without conflicts; and
2. Significantly reduced travel time since bicyclists on the route are granted the right-of-way at as many intersections as possible. This is usually accomplished by converting four-way STOP signs to two-way stops or switching two-way STOP signs to stop the cross street rather than the designated bicycle priority street.

Traffic calming strategies are needed to prevent the diversion of motor vehicle traffic to the newly prioritized bicycle street that would occur when the number of STOP signs is reduced.

The most bicycle-compatible traffic calming measures are the following:

- Speed humps⁽³⁾ and speed tables.
- Traffic circles (on streets with already fairly low traffic volumes).
- Reduced corner radii to slow the speed of turning traffic (most likely to be useful in combination with other measures that operate midblock).
- Road closures (traffic barriers—the most effective of all traffic calming measures).
- Half closures (less intrusive than full closures and offering greater flexibility in the accommodation of emergency vehicles).
- Forced turn channelization (highly effective if existing geometry permits it to be used).
- Median barriers configured to prevent through vehicular movements but permit other movements.
- 15 mph speed limits which slow vehicles significantly but have little adverse effect on bicycles.
- Traffic signals coordinated for a speed suitable to bicycle travel, e.g. 8-15 mph.
- Textured surfaces as a visual cue to reinforce more restrictive design features.

Streets that are candidates for conversion to bicycle priority streets should meet the following criteria:

- The concept should have the support of residents.
- The route should appeal to casual bicyclists by being on streets with low traffic volumes.
- The route should appeal to experienced bicyclists by being as direct and fast as possible.
- The route should not be a street classified as a major thoroughfare or a transit preferential street.

⁽³⁾ Speed humps, or pavement undulations are twelve feet long raised asphalt surfaces over which cars can comfortably travel at 25 mph. They are much different from speed bumps which are often used in parking lots and force cars to slow to 5 mph. See Chapter 6 for more discussion of speed humps.

- The route should reduce delays to the bicyclist by assigning the right-of-way to travel on the route.
- Motor vehicle access should be restricted only enough so that autos are not diverted from other thoroughfares onto the bicycle route.
- Intersections with major streets are or could be controlled by traffic signals.
- No major commercial businesses should be located on the bicycle boulevard.

The corridors that have been identified as providing the most benefit to bicyclists as bicycle priority streets are:

- ▶ Cabrillo Street between Great Highway & Arguello
- ▶ Cayuga Avenue between Silver and Foote
- ▶ Clay Street between Webster and Cherry Streets
- ▶ Duboce/Steiner/Waller/Scott⁽⁴⁾
- ▶ Eureka/23rd Street/Diamond Street/Elizabeth Street
- ▶ Francisco Street between Lyon Street and Cervantes
- ▶ Greenwich between Polk and Lyon Streets
- ▶ Harrold between Holloway and Ocean
- ▶ Holloway between Junipero Serra and Harrold
- ▶ Hugo Street between 7th and 3rd Avenues
- ▶ Kirkham Street
- ▶ Pacific Street between Mason and Polk Streets
- ▶ Page Street between Stanyan & Market
- ▶ Sacramento Street between Cherry Street and Arguello Boulevard
- ▶ Tiffany/29th/Chenery/Diamond/Circular Streets
- ▶ Ulloa/Forestside/Taraval between 15th Avenue and Dewey
- ▶ Vicente Street between Lower Great Highway and 14th Avenue
- ▶ Webster between Clay and Broadway
- ▶ 17th Street between Market and Kansas Streets
- ▶ 20th Avenue between Lincoln and Wawona
- ▶ 21st Avenue between Sloat Boulevard and Ocean Avenue
- ▶ 23rd Avenue between Lake and Fulton Streets
- ▶ 34th Avenue between Lincoln and Lake Merced Boulevard

These are not the only candidate streets for traffic calming but are streets that have the highest priority due to their importance to bicyclists.

⁽⁴⁾ Otherwise known as the wiggle.

BICYCLE PARKING

Parking Requirements

Bicycle parking is inexpensive to provide compared to automobile parking and, if credits are given for auto parking, the building owner can benefit as well.

The San Francisco Planning Code requires one bicycle parking space for every 20 off-street automobile parking spaces. However, since off-street auto parking is not required for most types of development in downtown San Francisco and within neighborhood commercial areas, bicycle parking is not often provided under the Code.

In order to better match supply to demand, San Francisco should adopt bicycle parking requirements based on type of land use. The requirements should apply to any new building, addition to or enlargement of an existing building, or change in use of a building. Initially it is recommended to adopt guidelines developed by the League of American Bicyclists for a community with a bicycle commute rate similar to San Francisco's. These requirements should then be modified to match local needs and political acceptance. The ideal outcome would be to always have a slight excess of bicycle parking spaces.

Building Access

Currently many building owners do not allow bicycles into their buildings. This includes many buildings owned and/or leased by the City of San Francisco for its own employees. This adversely affects many potential bicycle commuters who do not feel secure leaving a bicycle that can cost up to \$1,000 or more in a rack.

The City should require all new and renovated buildings to set aside space for indoor bicycle parking. The City should adopt a policy that leases for commercial buildings cannot deny tenants the right to bring bicycles into their leased space. Requests for exceptions to this policy should be made to the Department of Parking and Traffic, and allowed only if the building owner provides another type of Class I facility within the building such as check-in parking, monitored parking or restricted access parking. New buildings providing building access would receive credit towards meeting Class I parking requirements.

Bicycles should be allowed in City owned buildings unless alternative Class I parking is available for employees. Acceptable locations should be specified by the individual departments and subject to safety regulations and available space. In the interim before building access is universal, the City of San Francisco should not lease any space for City employees unless bicycles are allowed access into the buildings.

Retail Districts and Activity Hubs

The City should install on-street bicycle parking in retail districts, activity centers or developments in areas where businesses or landlords are not individually responsible for off-street parking. The current program where the City responds to requests of businesses has not been effective because of substantial paperwork and required fee payments.

By actively installing racks at locations of its own choosing, as is done in Chicago and Seattle, the Department of Parking and Traffic can provide a sufficient supply of bicycle racks and ensure compliance with placement criteria so that liability will not be an issue. Businesses should be actively consulted to identify rack locations, but should not be responsible for paperwork, waivers, or fees. Bicycle parking will benefit both the small business owners and their patrons who will now be able to bicycle to these locations.

It is recommended that this program be extended to bicycle parking in both the public right-of-way and in the private off-street parking lots of existing businesses, including supermarkets, super drugstores, retail stores, shopping malls, etc.

City-Owned Garages

Currently, four of the 15 city-owned garages provide bicycle racks: Civic Center (20 racks), Sutter-Stockton (7 racks) 5th and Mission (33 racks), and Golden Gateway (13 racks).

All city-owned parking garages should provide bicycle-parking for at least four to ten bicycles, depending on expected initial demand. If the racks are regularly used to capacity, additional bicycle racks should be installed. The fact sheet on City-owned Parking Garage Rates prepared by the Department of Parking and Traffic should be updated to indicate whether bicycle parking is provided in each garage and what the parking fee is, if any.

The City should consider a joint cooperative effort with BART to provide bicycle lockers at City garages closest to the downtown BART stations. Currently, BART commuters using these stations have no bicycle parking facilities available to them. These bicycle lockers also would be attractive to bicycle commuters who work downtown.

Major Employment Sites Outside the Central Business District

The responsibility for providing parking at non-City owned locations such as hospitals, universities and employment sites should fall to the property owners and employers. While new buildings will be subject to the zoning ordinance, existing locations should be encouraged to abide by the intent of the ordinance.

Transit Stations

Bicycle access to transit is a logical combination of modes and supports efficient land use objectives by minimizing the potential use of parking facilities adjacent to transit stations. San Francisco has a Transit First policy and very high transit ridership, yet the City currently lacks sufficient bicycle parking facilities adjacent to transit access sites and is far behind cities in Europe and Japan in the development and implementation of secure bicycle parking at transit stations. To remedy this situation, it is recommended that:

1. The major focus of bicycle parking improvements should be on the upgrade of parking facilities at the highest patronage stations.

2. Bicycle parking should be easily visible so that the potential or casual bicycle rider knows that bicycle facilities are available at the transit station. Even when sight accessibility is not available, appropriate bicycle parking signage can be used at elevators, escalators and entrances.
3. Bicycle lockers, or another form of guarded bicycle parking, should be available on a daily basis. Unlike most of the City's bicycle locker systems that require monthly locker fees and often have waiting lists, some form of parking should be available on a daily basis to support the spontaneous decision to bicycle to the bus or rail system.
4. Over the next two years, major planning and design activities will be directed towards San Francisco's Ferry Building, the Caltrain Station at Fourth/Townsend, and the Transbay Terminal. All of these plans should have a significant bicycle parking elements including but not limited to guarded parking, bicycle rental facilities, and bicycle support/maintenance facilities.
5. Discussions between the City of San Francisco, BART, the San Francisco Congestion Management Agency, and MTC should be initiated to address BART's current opposition to secure, guarded bicycle parking facilities, located below grade at major San Francisco locations.
6. Parking at downtown BART stations should be available via a cooperative effort between the City and BART.

The following recommendations apply to specific stations:

1. **CalTrain Station** - The existing bicycle lockers should be relocated to a more hospitable site adjacent to Fourth Street. An additional 24 bicycle lockers are recommended for this site.
2. **Transbay Terminal** - Four bicycle parking lockers should be located in the vicinity of the curved access road off Mission Street.
3. **16th Street Mission BART Station** - One or two bicycle lockers at one of these corners would meet any parking demands that may exist. It would be important to strategically locate the lockers to minimize vandalism and maximize their viability.
4. **24th Street Mission BART Station** - Four free standing lockers adjacent to the escalators are recommended for this site.
5. **Glen Park BART Station** - Four additional lockers should be provided on Bosworth Avenue, next to the bus pullout.
6. **Balboa Park BART Station** - Eight new lockers should be provided at the site, south of Geneva Street, adjacent to the existing bicycle racks.

Major Events

In the past, private bicycle organizations such as the San Francisco Bicycle Coalition, East Bay Bicycle Coalition, and the Silicon Valley Bicycle Coalition have provided free valet bicycle parking at public events, using inexpensive equipment such as portable fences, portable racks, and cables. The City should require organizers of large events to provide similar parking, either on their own or by contracting with local bicycle organizations.

Innovative Parking

Minneapolis provides a bicycle garage, in the form of a trailer that offers free indoor valet parking. If mobile, such a trailer could also provide bicycle parking at large public events such as festivals, sports events, concerts, and conventions. It might be publicly owned and rented to clients for a moderate fee. City bicycle parking requirements for such events could provide a strong incentive for privately owned trailers to fulfill the need.

Many locations in Europe offer guarded bicycle parking, sometimes in conjunction with repair and rental services. Japan and the Netherlands provide automated bicycle parking carousels, which allow storage of a large number of bicycles in a small space while preserving security. It might be efficient for a number of downtown businesses to satisfy their bicycle parking requirements by sharing the cost of the facility.

Parking Fees

Class II bicycle parking should be provided free, whether the rack is provided on the street, in a city building or in a parking garage. Class I bicycle parking should be free where automobile parking is free. To encourage the use of bicycles for commuting, yearly fees for Class I bicycle parking should probably not exceed \$80/year (\$7/month or \$0.25/day). This maximum fee should only be charged when the cost of providing Class I parking exceeds \$5/month per bicycle. If the costs of providing Class I parking are less, the fees should also be less.

TRANSIT ACCESS

Current Policies

Bicycle access on transit vehicles, connecting San Francisco to other areas, includes bicycles on buses, rail vehicles, ferries, and shuttles. The San Francisco Municipal Railway (MUNI), serving San Francisco, does not allow bicycles. The policies for each transit provider are summarized in the table on the following page.

CURRENT BAY AREA TRANSIT POLICIES			
Transit Agency	Bicycle Access Policy	Permit/Fees	Other Restrictions
MUNI	No access.	N/A	
SamTrans	Bicycles allowed if the bus is less than 50% occupied.	No.	Two bicycles per bus, seniors and wheelchair passengers have priority, cyclist must be at least 16 years old.
Golden Gate Transit	No access, except the Route 40, San Rafael to Richmond line.	No.	Two bicycles per bus, wheelchair and disabled have priority, bus must not be full.
AC Transit	No access, except certain buses on lines 65 and 67 to Tilden Park and all buses operated between 12:30 AM and 5:00 AM. These late night buses include lines F and NZ to San Francisco. Folding bicycles always permitted on all buses.	No.	Passengers have priority for seating areas, wheelchair passengers have priority.
Caltrain	Weekends, holidays all trains are accessible. Only trains marked with a "B" in timetable (non-peak period) are accessible weekdays.	Free Permit now valid indefinitely	Up to twelve bicycles on designated trains, only in cars with bicycle decal.
BART	Bicycles allowed, except when traveling in commute directions during peak hours. Cannot use 12th or 19th Street Oakland stations during peak periods.	\$3.00 for 3-year Permit	Bicycles allowed only in rear section of last car. Cyclist must be at least 14 years old or accompanied by an adult. Folding bicycles allowed on all trains.
Golden Gate, Red & White and Blue & Gold Ferries	Bicycles allowed. Ferries operate to Alameda, Oakland, Sausalito, Tiburon, Vallejo and Larkspur.	No.	
Caltrans Bay Bridge Bike Shuttle	Operates at 45 minute headways during peak periods only between MacArthur Park BART and Transbay Terminal	Fare is \$1 each way.	

Much progress has been made in the last several years to improve bicycle access on transit in the San Francisco Bay Area. When the Southern Pacific operated what is now the Caltrain rail service, bicycles were not allowed, except during one six-month trial period. In May, 1994 Caltrain used some of San Francisco's Transportation Development Act (TDA) funds to remove seats and install bicycle racks on 52 cars. Since then, the number of trains allowing bicycles has steadily increased to

90 percent of all weekday trains. Caltrain management expects that all trains will allow bicycles by the summer of 1995.

SamTrans now allows bicycles on all of its buses, subject to some restrictions. AC Transit and Golden Gate Transit have begun allowing bicycles inside buses on some lines. BART has allowed bicycles on non peak period trains since 1972. Obtaining a permit was a very inconvenient process but they can now be obtained by mail. Temporary one-time permits are available at stations. MUNI is the only major Bay Area transit operator that does not allow bicycles on its vehicles.

Recommended Actions

After contacting bicycle groups and transit operators that serve San Francisco, and assessing current bicycle access policies, the following actions are recommended to be taken by the City of San Francisco to improve bicycle access:

- Assist the BAC, SFBC, and the Regional Bicycle Advisory Committee (REBAC) in their ongoing efforts to improve bicycle access. The following specific improvements are of high priority to the bicycle community:
 - ▶ **BART:** Retain the BART Bicycle Accessibility Task Force as a permanent body. Allow bicycles in cars other than the last one since late at night personal safety can be a concern in this car. Consider the elimination of BART permits. Provide an education and outreach program to inform BART users of bicycle related rules. Expand bicycle access hours and consider a retrofit (similar to Caltrain) or modification of new cars to allow greater bicycle access.
 - ▶ **CalTrain:** Elimination of permits. Also, see the action item below.
 - ▶ **MUNI:** Some type of bicycle access. Also, see the action item below.
 - ▶ **AC Transit and Golden Gate Transit:** See the action item below.
- The City's Bicycle Coordinator should actively pursue the following bicycle access policies on MUNI:
 - ▶ Install bike racks on buses so that the Sunday and holiday Line 76 Marin Headlands service across the Golden Gate Bridge can carry bicycles. The MUNI Planning Department has expressed an interest in seeking funds for this project.

- ▶ Allow bicycles on board (space permitting) on Line 76 and on lightly patronized neighborhood service in hilly areas of the City. Line 36 Teresita serving Mount Davidson is a good candidate.
- ▶ Allow cyclists to bring disabled bicycles (due to mechanical failure or accident) on board MUNI vehicles, space permitting. The BAC has suggested this and the MUNI Planning Department is willing to consider such a policy.
- Support bicycle access on all Caltrain trains, as proposed by their staff. Assist Caltrain in securing funding (such as the City's TDA funds) to provide more bicycle racks on reverse commute trains that are already at the 12 bicycle capacity.
- Encourage AC Transit and Golden Gate Transit to install bike racks on all buses serving San Francisco and help them secure funding. Golden Gate Transit staff has proposed installing racks on Lines 80, 63, 65, and 40 and has obtained two test racks. They have requested that the three counties in which they operate apply for TDA funds for this project. Only San Francisco agreed to apply, contingent upon application by the other two counties.

Bridge Access

Of San Francisco's two bridges, only the Golden Gate Bridge allows bicycling. On weekdays, cyclists share the east sidewalk with pedestrians. On weekends and weekday afternoons, bicyclists have exclusive use of the west sidewalk. At night (9 PM to 5 AM) cyclists may cross the bridge on the east sidewalk, where electronically controlled gates allow passage.

There are no sidewalks on the 7-mile long Bay Bridge and bicycles are not allowed. However, bicycles are accommodated in this corridor at various times on BART, AC Transit, Red and White ferries, and a Caltrans shuttle vehicle.

The following actions are recommended to be taken by the City of San Francisco to improve bicycle access:

- Encourage Caltrans to increase the frequency and add additional East Bay pick up points to the Bay Bridge Shuttle. Help them in securing funding. Caltrans looked into this as a project to be funded by increased tolls proposed in the Bay Bridge Congestion Pricing Study, but it was not included in the funding package.

- Encourage the Golden Gate Bridge Highway and Transportation District to improve the current circuitous bicycle access to the west walkway on the San Francisco side of the bridge.

CITY ORDINANCES AND POLICIES

The following policies are recommended for adoption by San Francisco. Many of these policies are already in use by cities in California and the United States, including Palo Alto, Davis, Seattle, Portland, and Boulder.

- Amend the Transportation Element of the Master Plan as recommended (see Appendix G).
- Amend the Traffic Code to delete superfluous and contradictory definitions and regulations.
- Revise the Traffic Code to eliminate the reference to age in section 96, and allow adults as well as children to ride on sidewalks in residential areas.
- Adopt parking requirements based on land uses rather than number of auto spaces provided.
- Allow sidewalk riding in certain non-residential areas and add language to traffic code governing the behavior of bicyclists with respect to pedestrians.
- Re-evaluate the regulation of bicycle messengers.
- Refine language in the Traffic Code regarding parking of bicycles on sidewalks and roadways.
- Request that the Legislature amend the Vehicle Code so that:
 - ▶ Bicycles can be exempted from regulatory signs (such as: Do Not Enter) at local discretion.
 - ▶ Bicycles can travel in bus-only lanes.
- Adopt new ordinances:
 - ▶ Establishing all bicycle lanes on the Master Plan in toto, not individually, (and as thereafter amended).
 - ▶ Requiring showers in new buildings.

- Adopt a comprehensive program to deter bicycle theft and recover stolen bicycles without mandatory registration.
- Provide through lanes where straight-through bicycle lanes are not provided to the left of right-turn-only lanes, additional width for bicyclists in the rightmost through lane. This should be done regardless of whether bicycle lanes are provided on the street.
- Recognize the needs of bicyclists for smooth and level pavement in maintenance policies.
- Reimburse city employees for expenses when they travel by bicycle on official business.
- Maintain fleets of bicycles and helmets for use by City employees along with motor vehicle fleets (as done by the Metropolitan Transportation Commission and Caltrans District 1).
- Authorize MUNI bus and trolley drivers to allow access to bicyclists experiencing mechanical difficulty.
- Require hospitals, emergency rooms, and clinics to report all instances of bicycle injury to the San Francisco Police Department and to the bicycle coordinator. This information can help determine patterns and causes of injuries and aid in accident and injury prevention.
- Establish a policy providing incentives for households that do not own automobiles, such as a tax credit, a coupon for bicycle equipment subsidized by the City, a bicycle equipment manufacturer, or a large corporation, or other similar incentive.
- Amend the *Guidelines for Environmental Review: Transportation Impacts*, published by the San Francisco Department of City Planning for consultants who are conducting transportation analyses for both Environmental Impact Reports and Negative Declarations. These guidelines should require that all traffic counts conducted as part of the study also include bicycle counts at the same locations where motor vehicles are counted. An inventory of existing bicycle parking should also be conducted within a two-block radius of the site. The project's impacts on bicycle travel on any street in the City should be identified. Mitigation measures should not hamper bicycle circulation.

- Train all San Francisco engineers and planners in the needs and concerns of bicyclists, to make them aware of issues that affect bicycles. This training is especially important because most university civil engineering and city planning curricula all but ignore the bicycle, and on-the-job training must fill the void.
- Utilize the existing registration and CLETS programs to assist in enforcing bicycle theft law. Encourage the implementation of a mandatory state-wide registration program.

BICYCLE SAFETY: EDUCATION AND ENFORCEMENT

Accidents

There is an urgent need to improve bicycle safety conditions in the City. Between 1989 and 1993, there were 35,239 reported total vehicle accidents and 2,353 accidents involving a bicyclist. The number of bicycle accidents per year appears to have remained relatively steady, with between 424 and 496 reported bicycle accidents per year. Since the number of reported motor vehicle accidents has decreased slightly, the proportion of bicycle accidents to total accidents has increased from 3.4 percent to almost 4 percent. Since many bicycle accidents are not reported to the police department, these figures understate the actual number of bicycle accidents.

The party at fault was listed as the bicyclist in 49 percent of these incidents, the driver or parked vehicle was listed as the party at fault in 37 percent of the cases, the pedestrian was listed at fault in two percent of the cases, and no party at fault was identified in 11 percent of the cases. These statistics indicate that both bicyclists and motorists need to improve their driving behavior in order to increase the safety of bicyclists on San Francisco streets.

The five most common vehicle code violations resulting in a bicycle accident caused by an automobile driver are:

- ▶ Opening car door when unsafe
- ▶ Failure to yield when turning left
- ▶ Unsafe turn and/or without signaling
- ▶ Unsafe speed
- ▶ Failure to stop at red light

The five most common vehicle code violations resulting in a bicycle accident caused by a bicyclist are:

- ▶ Unsafe speed
- ▶ Failure to yield to approaching traffic
- ▶ Passing on right when unsafe
- ▶ Failure to stop at red light
- ▶ Wrong-way riding

A combination of education and enforcement (in addition to design and maintenance features cited previously) are recommended to improve bicyclist safety in the City.

Education

The recommended Education Plan is divided into programs for two distinct audiences:

- **Children's Education Program:** To provide school-age children with a strong foundation for safe bicycling,
- **Motorist/Cyclist Education Program:** To promote the safe sharing of roadways between motorists and cyclists.

Children's Education Program

After researching and assessing existing educational programs geared towards children, three components are needed to make the proposed plan successful:

- **An Action-Oriented Teaching Approach** - Learning must take place on a bicycle rather than in a classroom-like setting. When each child is on his/her own bicycle, it will allow them to learn safe/riding techniques more readily than by a classroom presentation alone.
- **A Repetitive-Practice Teaching Process** - Sessions will emphasize a short list of concepts at each session and will repeat them for reinforcement. Riding a bicycle under the supervision of an instructor on numerous occasions will increase the students' level of comprehension and retention.
- **A Sense of Accomplishment for Completing the Program** - Rewards in the form of discounts for bicycle-related goods and certificates of completion will be handed out at the end of the program. Incentives for completing the program will not only boost the initial interest in the plan but it will also help to keep children interested throughout the four-week course.

Recommendations for Children's Bicycle Safety Education

A four week program of three two-hour weekly learning sessions and one bicycle rodeo is proposed to give participants hands-on knowledge of how to travel safely throughout the City of San Francisco on a bicycle. The program is also designed to promote bicycling as a fun activity for youths, who in the future could choose bicycling as a transportation alternative. It is timed to coincide with the conclusion of the proposed "San Francisco Bicycle Safety Week" (see Motorist/Cyclist Plan) in June.

The Children's Program will target elementary school age children in San Francisco. This age range—third through sixth grades—will reach children who are still in the formative years of bicycle riding. Even within this limited age span, a fairly wide range of bicycle ability among the participants will exist; the children will probably need to be broken into two groups due to the difference of aptitude. Staff will need to work with the San Francisco Unified School District to promote the program in the elementary schools.

The plan calls for a four-week program that will meet on Saturday mornings. The first three weeks will be two-hour educational sessions, with the fourth week being a city-wide bicycle rodeo for graduates of the Children's Program.

Since a four-week program is a serious time commitment, an incentive is required for the children to complete the program. This incentive comes in the form of a bicycle rodeo for only the children who have completed the three-week education sessions. The bike rodeo is not only the culminating event for the participants, but it is the event where the Children's Program's sponsors will get the most exposure. With a media sponsor on board, the rodeo and its sponsors will most likely receive some media coverage. The rodeo also provides all of the sponsors a forum to reach their target audience—bicycle riders and their parents—with their products.

Aside from the bicycle rodeo, perhaps the biggest incentive for the children to complete the Children's Program is the opportunity to buy bicycling equipment at discounted prices through the help of the sponsors. All rodeo participants will receive coupons for discounted items at the local bicycle store sponsor, while the other sponsors can donate prizes for winners of the bicycle rodeo.

It is acknowledged that this safety education program will reach only a small fraction of San Francisco's school children. A more intensive program to reach all school children would require the commitment of the San Francisco Unified School District or the State of California. However, providing safety education for children and their parents who want it should be considered a public service and be given high priority.

Motorist/Cyclist Education

The goal of the Motorist/Cyclist Program is to educate cyclists about their responsibilities for safe operation of a bicycle and to teach motorists about bicyclists' rights and responsibilities and appropriate methods for sharing the road with bicyclists. The program has a number of components:

Department of Motor Vehicles (DMV) - Working with the DMV will allow the campaign to reach drivers—a key target audience for this campaign. It is proposed that an add-in brochure be enclosed in the annual renewal notice for automobile registration to the owners of cars registered in San Francisco. There is precedent for DMV mailer add-ins, since they already include items on insurance and alcohol consumption limits.

In addition, it is recommended that the DMV work with the California Bicycle Advisory Committee to revise the *Driver's Manual* to include more information for motorists regarding bicycles on the roadway—what to expect and how to respect their travel space.

Finally, it is recommended that the City request that the DMV review questions developed by the League of American Bicyclists and revise as appropriate their written questions for the driver's exam relating to bicycle issues.

Media Campaign/Public Service Announcements (PSAs) - The PSA component will be a key element in the success of the Motorist/Cyclist Program. Whether the PSAs are broadcast on television or radio, the message of safe road sharing will reach a mass audience, and support the mailer portion of the campaign. An on-air media person, local celebrity, actor, politician or athlete could be used to deliver the message of safe road sharing.

Awareness/Outreach Events - Another way to promote the Motorist/Cyclist Program will be the proclamation of "Bicycle Safety Week" by the Mayor. It is proposed that "Bicycle Safety Week" include a series of events leading up to the American Youth Hostel Great San Francisco Bicycle Adventure, an annual bicycle fun ride which is held on the second Sunday of June.

The week of activities would include:

- ▶ Mayor's Press Conference
- ▶ Bicycle Safety Demonstrations
- ▶ Employer Outreach Event (a bicycle ride through the Financial District for the ten participating companies)
- ▶ Children's Program Bicycle Rodeo

American Youth Hostel Great San Francisco Bicycle Adventure - This event is an excellent opportunity to distribute bicycle safety and roadsharing pamphlets. Information will be distributed prior to the ride.

Critical Mass Ride - Distribute safety materials at Critical Mass, a gathering of bicycle enthusiasts which begins at Justin Herman Plaza, across from the Ferry Building, at 5:30 PM on the last non-holiday Friday of each month.

Enforcement

Enforcement of traffic laws should be composed of several strategies: citations, training for police officers, traffic school, fix-it tickets, verbal warnings, notes to parents (for juveniles), as well as positive reinforcement techniques such as rewards for proper or exemplary behavior. The public should be informed in advance before any new enforcement measures are implemented.

Citations - The most commonly perceived enforcement strategy is issuing citations to violators of the Vehicle Code or Traffic Code. The San Francisco Police Department issued 630 citations to bicyclists in 1991-1993. It is unknown how many citations were issued to motorists for failing to yield the right-of-way to a bicyclist or otherwise causing or almost causing a bicycle accident. A review of the most severe car-bicycle crashes—those that resulted in a fatality—revealed that motorists did not receive a citation when the motorist was deemed at fault.

In a city with many other serious enforcement priorities, it is important to get across the message to the police that bicyclist and motorist violations are a significant problem (see following section).

Training for Police Officers - Training for officers can take place through existing channels such as inter-office memos and correspondence, and also through peer education using the officers that patrol on bicycles. Support from higher up in the administration will be essential if an increased enforcement program is to succeed.

Reduction in Bail for Bicyclists - State law AB669 (passed in 1994) allows cities the discretion to reduce fines for infractions of the vehicle code incurred by bicyclists. The assumption behind the legislation was that some police departments are hesitant to enforce certain bicycle violations, particularly when no threat to public safety is involved, due to the extreme fines involved: up to and exceeding \$200. This authority that is being relinquished to localities should be embraced by the City of San Francisco. It is recommended that fines for most bicyclist infractions be reduced to \$25.

Traffic School - Once a bicyclist or motorist has received a citation, it should be viewed by the City as an opportunity to educate him/her. It may be very helpful to combine both bicyclists and motorists in the same class so a dialogue can ensue and they can learn from each other. As an alternative to the fine, violators should be given the option of enrolling in such a traffic school. Traffic school curriculum should be developed that focuses primarily on bicycle issues from both the bicyclist's and the motorist's perspectives. Motorists cited for bicycle infractions and opting for traffic school would be required to enroll in the bicycle-issue oriented school if they opt for a traffic school. Traffic school for bicycle offenders and motorist offenders would, of course, not go on their record.

PROMOTION OF BICYCLING

TDM Programs

Bicycling is an ideal commute alternative in San Francisco, a city seven miles wide, where 80.4 percent of the employed residents also work in the City. Unfortunately, only one percent of the employees in San Francisco chose a bicycle as their form of transportation in 1993. This percentage ranked sixth among the eight counties in the Bay Area Region, ahead of only Solano and Contra Costa Counties.

Companies with over 100 employees are mandated by law to have a Transportation Demand Management (TDM) program to promote alternative modes of transportation to single occupant vehicles. These programs have focussed on education, information and incentives to get people to stop driving alone to work. Carpools, vanpools, and transit are the most popular alternative modes. Bicycle commuting is often an overlooked or underutilized opportunity for attaining these trip reduction goals.

An effective bicycle commuting encouragement program must include the following:

- ▶ The TDM program must identify bicycle commuting as an option;
- ▶ The TDM program must provide an incentive to use bicycle commuting; and
- ▶ The TDM program must support and applaud bicycle commuting.

Identify Bicycle Commuting as an Option - An extensive advertising campaign should include information about monetary, environmental and health benefits of bicycle commuting. It should also address and attempt to dispel many of the perceived obstacles. Many of the TDM programs currently in effect use newsletters, special events, and workshops to educate potential bicycle commuters. A bicyclist information network can be used by the potential bicycle commuter to learn what the best commute routes are for their personal needs, to locate experienced bicycle commuters in their area who are willing to advise and escort during the first bicycle commutes, and to learn of upcoming events and activities.

Provide an Incentive For Bicycle Commuting - The most effective incentives for bicycle commuting currently being used are:

- The provision of secure, protected, convenient and free bicycle parking.

- **Cash Incentives**, which has taken a number of forms:
 - ▶ A cash dividend for bicycle commuters for each day that they commute by bicycle.
 - ▶ Reimbursing the employee \$0.07/mile for company business travel made on a bicycle; and
 - ▶ Assisting the employee in the purchase of a bicycle.
- **Convenience Incentives**;
 - ▶ Guaranteed ride home;
 - ▶ Fleet bicycles for the use of the employee during business hours which are often also available for the employee to use for their commute on a trial basis;
 - ▶ On-site bicycle repair kits;
 - ▶ On-call repair services with a local bicycle shop;
 - ▶ Flex hours so the employee can avoid rush hour or darkness;
 - ▶ Showers and locker rooms for clean-up and changing after the commute;
 - ▶ Closet space for storage of clean clothes; and
 - ▶ Relaxed dress codes for bicycle commuters.

Support and Applaud Bicycle Commuting - Endorsement of bicycle commuting by those in charge is a significant aspect of a promotion program. Prospective bicycle commuters are more apt to try out this unconventional mode if it is acceptable to their supervisors. Organized and advertised rides such as "Ride with the CEO" or "Ride with the Mayor" clearly demonstrate their support and enthusiasm. Advertising campaigns aimed at informing commuters on the merits of bicycling should include endorsements by key officials as well as interviews with peers who currently commute by bicycle. Programs by a city or company to promote bicycle commuting should be as comprehensive as the programs established to encourage transit use. If cash subsidies are offered for transit use but not for bicycling, the message that bicycles are not as acceptable as transit is clearly being given.

Recommended Employer Outreach Campaign

A pilot program to introduce San Francisco companies to bicycling as a viable commute alternative and to encourage their employees to consider using a bicycle is proposed. The pilot program is targeted at 10 of San Francisco's largest employers and has been designed to encourage them to include bicycling in their Transportation Demand Management (TDM) programs. The Pilot Employer Outreach Campaign will strongly encourage and support inclusion of bicycling as one of the alternatives to driving alone that these companies can offer their employees. Details of a proposed strategy are contained in Chapter 10.

Existing San Francisco Bicycle Events

During the year there are many sporting and other theme events held in San Francisco. These events can attract regional and even national attention and offer the City and other organizations an opportunity to reach many people while providing a good time.

The most well known and well attended bicycle events in San Francisco are the Macy's/AYH *Great San Francisco Bicycle Adventure*, the *Tour de San France-isco*, and the *Different Spokes AIDS bike-a-thon*. These events are charity fund raisers and attract bicyclists of all ages and abilities. Promotion efforts could be directed towards safety education and the advantages of bicycle commuting. Event directors could use the opportunity to teach participants the rules of bicycling courtesy.

Another opportunity for bicycle commuting promotion and education are those events which are directed at changing our commute habits. *Bike-to-Work Day*, *Beat-the-Backup*, and *Earth Day* are existing events which could be expanded to encourage more participation. Instead of having only an annual *Bike-to-Work Day*, it might be preferable to have *Bike-to-Work Week* or a monthly *Bike-to-Work Day*.

Other events in San Francisco such as street fairs, *Festival d'Italia*, *Cherry Blossom Festival*, and July 4th fireworks should provide good bicycle access with free secure bicycle parking. As part of the event advertising, the best bicycle route to the event should be published along with the location of the bicycle parking.



1. INTRODUCTION

In the past, accommodating the bicycle in San Francisco has been all but ignored in favor of an emphasis upon facilitating automobile and transit travel. Given the built-out nature of San Francisco, transportation planners now recognize that the City cannot physically accommodate more roads, travel lanes or freeways. Increased attention has been given to transit and light rail improvements, since they have a higher capacity of person trips per hour within a given right-of-way width. Bicycle facilities are also a cost-effective and environmentally sound way to utilize limited resources to provide the most mobility to the largest number of people.

This report presents a comprehensive review of the many aspects of the policies, procedures, practices and physical infrastructure of the City and County of San Francisco that affect bicycling. It makes recommendations for making bicycling in San Francisco safer and more convenient through a variety of efforts including street improvements, bicycle parking facilities, new City policies, education programs, promotion efforts, and bicycle access on transit. In total, if implemented these recommendations will ensure that bicycling is treated as a viable transportation mode in the City.

Bicycle Transportation in Context

According to the 1990 census, 1.0 percent of San Francisco's employed residents, or 5,000 commuters, bicycle to work. This is an increase from 0.8 percent in 1980. The average for the Bay Area is 1.1 percent. These statistics illustrate that even under existing conditions, which are by no means ideal, the number of San Franciscans who commute by bicycle is just slightly less than the Bay Area average. If a serious effort is made to pro-actively accommodate bicycles, they can be a significant part of the solution to the City's transportation problems.

People bicycle for a variety of reasons. Many bicyclists bicycle for environmental reasons. As these bicyclists are often the most politically active, they tend to be the most noticed by City officials. There are many who bicycle for other reasons. For those with no car, bicycling affords the personal mobility of an automobile. San Francisco has the highest percentage of zero-vehicle households in the Bay Area—30.7 percent. Some of these residents are existing bicycle commuters, but the remainder constitute a large potential pool of bicycle commuters. Others bicycle because they are frugal with money or time. Bicycling is the least costly transportation alternative and is often faster than bus travel. Lastly, there are those who bicycle for fitness, preferring to conduct their daily workout during their commute time rather than going to a gym. Thus, improved bicycle facilities will benefit a wide range of citizens.

If this plan is fully implemented, it is envisioned that, ten years from now, bicycling in San Francisco will be as mainstream as recycling is today. Bicycling has several similarities with recycling: they both received a boost after the original Earth Day in 1970 and they both are environmentally and economically sound investments of public monies. Therefore, with cost-effective expenditures of tax dollars environmental concerns are satisfied simultaneously with energy savings. In short, improved bicycle facilities can be what recycling programs have already become—a win-win situation for cities that help the environment while saving tax dollars.

The Public Participation Process

The preparation of this study involved input from the public in a variety of formats. Four public meetings were held to obtain input from bicyclists and other members of the public on the plan. Comments from the public on all issues were received in writing throughout the study. In addition, the San Francisco Bicycle Advisory Committee (SFBAC) and the San Francisco Bicycle Coalition (SFBC) reviewed all preliminary work products.

The first draft of the Bicycle Commute Routes map was prepared by the SFBAC before a consultant was hired, and was distributed for public comment. Written comments on the proposed routes were received and compiled by the Department of Parking and Traffic (DPT) and the SFBAC, and a public meeting was held on July 25, 1994 attended by 50 people. A second public meeting was held on October 12, 1994, attended by about 100 people, to obtain public input on all other components of the plan including safety, parking, policies, and traffic calming. A third public meeting was held on January 9, 1995 to review the Draft Recommended Bikeway Network; this meeting was attended by 65 people (on one of the wettest nights of the year). A fourth public meeting was held on January 24, 1995 to review the other recommendations of the draft plan; about 50 people attended. A total of 110 letters and faxes have been received to date. Public comment will be incorporated into the Final Draft of this report.

Goals and Objectives

The goal of the Bicycle Plan is to provide a comprehensive guide for efforts that will make San Francisco a more "bicycle-friendly" city. Within that overall goal are a number of objectives that were developed during the course of the study by the City, SFBAC, SFBC and the consultants:

1. Improve Facilities for Bicyclists

- ▶ Provide a comprehensive network of signed and mapped routes for bicyclists and provide improvements that expedite travel and improve safety along these routes;⁽¹⁾
- ▶ Increase the number of secure parking areas for bicycles;
- ▶ Provide for uniform markings and design standards;
- ▶ Improve access to transit modes and over bridges; and
- ▶ Improve maintenance of streets and bikeways.

2. Improve Bicycle Safety

- ▶ Provide safer facilities;
- ▶ Educate bicyclists and motorists on regulations, rules of the road and safe sharing of the roads; and
- ▶ Increase enforcement of bicycle-related violations on the part of both motorists and bicyclists.

⁽¹⁾ The establishment and signing of routes will not in any way preclude or discourage the maintenance or improvement of other streets.

3. Promote Bicycling in the City

- ▶ Increase bicycle use as an alternative to the auto;
- ▶ Encourage bicycle use by potential cyclists; and
- ▶ Encourage bicycle use by visitors to the City.

4. Increase Bicycle Funding

- ▶ Establish priorities for project funding;
- ▶ Match projects and funding sources; and
- ▶ Identify new funding sources.

Future Actions

The implementation of this plan, as is true of all bicycle friendly cities, involves the participation and the cooperation of many different City departments. In addition to the Department of Parking and Traffic, recommendations will be made that are the primary or secondary responsibility of the following departments: the Department of City Planning, Recreation and Park Department, the Department of Public Works, the Police Department, and the municipal railway (MUNI). The National Park Service will be responsible for implementing improvements in the Presidio and Caltrans will need to approve recommendations affecting state highways.

Finally, there are still some issues that affect bicycling that are not addressed in this report in great detail. Therefore, there is a need for future studies in several areas to fully implement these recommendations as well as to identify other measures that will improve the safety and quality of bicycling in San Francisco. These studies include:

- ▶ Detailed analyses of high bicycle accident locations;
- ▶ Impact of auto-free Market Street on bicycling conditions;
- ▶ Railroad track location identification;
- ▶ Contra-flow bus lanes and impact on bicycling conditions;
- ▶ Neighborhood level studies to identify traffic calming strategies to implement bicycle-priority streets;
- ▶ Bicycle safety improvement studies;
- ▶ Bicycle safety education curriculum for SF Public Schools;
- ▶ Bicycle safety education for adult cyclists;
- ▶ Bicycle circulation improvements in the Presidio;
- ▶ State legislation to improve bicycling's acceptance and safety; and
- ▶ Joint development opportunities for downtown bicycle parking.



2. REVIEW OF EXISTING CONDITIONS

INTRODUCTION

This chapter presents the analysis of existing bicycle conditions in San Francisco. This analysis covers four subject areas:

1. An evaluation of existing Class I, Class II and Class III bicycle facilities on the Signed Bikeways Plan;
2. Identification of the main attractors and generators of bicycle trips;
3. Analysis of bicycle accident history; and
4. A review of the City and County organizational structure as it pertains to the planning, funding, implementation and maintenance of bicycle facilities.

REVIEW OF CURRENT BIKEWAYS PLAN

This section describes the process used by the consultant to inventory and evaluate the bikeways on the Signed Bikeways Plan of the San Francisco Master Plan. The review of the routes on the current bikeways plan is composed of three main subtasks: rational data base development, field assessment and documentation. The remainder of this section will describe the evaluation process and present an overall assessment of the existing bikeway system. Recommendations as to whether any of these existing routes should be revised, abandoned or retained will be made in Chapter 3: Recommended Bikeway Network.

Description of the Evaluation Process

Developing a Rational Database - The City's existing (1982) Signed Bikeways Plan shown in the San Francisco Master Plan map has no route numbering system or other way of naming the routes. The map also does not differentiate between existing and proposed routes. The first step then, was to develop a system of identification for the various routes so that they could be systematically inventoried and analyzed. The City's existing bikeways were assigned a route number and name so that each route and each segment (street) within a route could be identified and incorporated into a data base. Twenty-four (24) routes were identified and numbered from #1 to #24. These routes are shown in Figure 2-1. Each route is comprised of 1-20 segments, a segment being designated for each portion of the route that is on a different street.

A database was designed to include the following evaluation criteria:

- ▶ Width of curb travel lane (greater or less than 12 feet);
- ▶ Number of traffic lanes in one direction;
- ▶ Width of cycling zone (less or more than three feet);



FIGURE 2-1 KEY TO EXISTING ROUTES

- ▶ Traffic mix and type of transit: auto, bus (diesel vs. overhead electric), light rail;
- ▶ Traffic intensity: function of volume, congestion, speed;
- ▶ Number of traffic controls: signals, STOP signs;
- ▶ Amount and turnover of on-street parking;
- ▶ General safety: sense of safety or risk, physical, social (crime);
- ▶ Terrain: steepness, greater than 3 percent;
- ▶ Obstacles: tracks, pavement conditions, pedestrians;
- ▶ Turning: left or right involving risk conditions; and
- ▶ Intersections: identification of key nodes within a segment.

Field Assessment of Riding Existing Routes - Each route of the City's Signed Bikeways Plan was evaluated in the field by riding a bicycle. Each route was assessed against the evaluation criteria on a qualitative basis. Other information that was gathered during this phase concerned major intersections along each route and main attractors served by each route. The emphasis of the field assessment was to objectively identify the features of each route rather than to judge or rate the route.

Documentation of the Evaluation - The survey data were entered into a Paradox data base. Each segment of the route has an address in the data base which will be useful for future implementation and planning activities. In particular, it can be integrated into a desktop mapping software such as MAPINFO.

The extensive information stored in the Paradox data base was extracted and summarized on tables. There are one to five tables per route depending on the complexity and variables of the route. These summary tables and a glossary are on file at DPT offices.

Summary of Assessment of the Existing Bikeway System

The bikeway system as presented in the Master Plan consists primarily of a single map which depicts Class I, Class II and Class III facilities. There is no documentation of the number of miles of the system by Class or in total. The map does not differentiate between existing and planned projects, and there is no description of planned or programmed additions or improvements to the bikeway system.

In the field, the system as a whole is not very visible. Few of the designated Class III Bike Routes are signed and in other cases, some signs are present but do not continue the full length of the designated route. The existing bikeway system consists predominantly of Class III bike routes.

Some of the Class II facilities indicated on the map are striped but not signed. Some bike lanes are located in commercial areas such as Upper Market where double parking in the bike lanes is common. Most of the indicated Class II facilities, such as on Cabrillo Street and Twentieth Avenue, have not been implemented.

Many of the Class I facilities are effectively multi-use trails and are not designed to the highest standards for such trails (twelve feet or more of pavement with a two-foot buffer on either side). Some do not meet even the minimum standards. Depending on time of day or day of week, they are often usable for only leisurely rides due to the variety of the trail users and their vastly varying speeds. Such trails are often unusable for a fast-paced bicyclist, because the trails are too narrow

to accommodate several different modes at several different speeds. There are notable exceptions, most importantly the Panhandle bike path which is signed as a bike route. The major drawback of a Class I bike path parallel to a major roadway, such as the Panhandle path, is the potential for conflicts at intersections. Left-turning motorists in particular do not see and therefore do not yield to bicyclists entering the intersection from the path. This is an inherently dangerous move and is difficult to mitigate. The visibility problem at the intersection of Masonic Avenue and Fell Street during non-peak hours is compounded by parked cars between the travel lane and the bike path which shield the bikes from the motorists' view.

The most common deficiencies of the existing route system are:

1. Designating trails that are used by a variety of modes (pedestrians, baby-strollers, roller bladers, persons walking dogs, etc.) as Class I facilities. Examples include the Great Highway path and the Lake Merced path. Until these multi-use trails are widened to accommodate the mixed volumes of pedestrians and bicyclists, they should not be designated as Class I facilities.
2. Applying the Class I designation to paths that also serve as sidewalks. Examples of this are Sunset Boulevard and O'Shaughnessy Boulevard. Due to the lack of formal sidewalks, both of these paths also function as the sidewalk. The pavement on the path is not as well maintained as the roadway. Litter and debris do not get swept regularly. Potholes and cracks in the pavement are not repaired. Along Sunset Boulevard, there are many cross-streets which a northbound bicyclist on the path has to cross in a direction against the normal flow of traffic. Even southbound bicyclists are not as visible to right-turning motorists as they would be if they were riding on the road. In conclusion, the two major advantages of riding on the roadway rather than on such paths (over and above the sharing-with-pedestrians issue discussed above) are:
 - i. Bicyclists are more visible to motorists when entering intersections; and
 - ii. Bicyclists can travel at higher speeds and can expect a higher quality pavement surface.
3. Bike lanes, whether adjacent to the curb or adjacent to a row of parked cars are often utilized by parked or double-parked vehicles, particularly in commercial areas. Illegally parked vehicles can also be a problem in locations with wider curb lanes.
4. Bike routes that jog from street to street expose bicyclists to more motor vehicle conflicts.
5. The effectiveness of many bike routes suffers from the placement of numerous STOP signs. These signs unnecessarily slow bicycle traffic. One STOP sign is equivalent in travel time to making the route 0.1 mile longer. On Twentieth Avenue, the problem is compounded by the use of two-way STOP sign controls, giving cross-traffic the right-of-way. The bicyclist must then wait until there is an adequate gap in traffic before proceeding.

6. Many of the roadways that are the most direct and flattest are also major thoroughfares and transit routes. The road system for San Francisco was initially developed so that the major roadways were aligned along the flattest contours. Consequently, the flattest route from Point A to Point B is often along a major thoroughfare such as Sloat Boulevard. Using Vicente Street and/or Wawona Street as a lower volume alternative route requires significantly more climbing.
7. Many of the City's streets are laid out in a grid pattern, which is a positive attribute as it allows for several bike route alternatives. However, some parts of the City have only one main route through them because of topographical constraints. Portola Drive and O'Shaughnessy Boulevard are good examples. In some cases the diagonal route is the most direct, such as Ocean Avenue or Third Street between Islais Creek and Candlestick.

While the latter two points are not deficiencies of the existing bikeway system, they do highlight the unique characteristics of the street system of San Francisco. Recognizing the limitations of the various corridors will be an integral part of the alternatives analysis prior to the development of the recommended route system.

ATTRACTORS AND GENERATORS

The major attractors of bicycle trips in San Francisco are presented in Figure 2-2. This inventory is preliminary. Additional attractors and generators will be added as they are identified. The attractors shown here include the major employment, education (colleges, universities and high schools), government, retail/shopping, medical, and recreation centers. The primary generators are residential land uses. Also included in the category of generators are transit centers and connections to regional bike routes. The purpose of the attractor/generator analysis is to identify the most significant locations to be served by the bike route plan. For example, is S.F. City College being served? Is the Outer Richmond connected to the Financial District? Findings of this analysis will also help to determine where bicycle parking is most needed.

SAN FRANCISCO BICYCLE ACCIDENT REVIEW

The Department of Parking and Traffic provided the consultant with bicycle accident data from the Police Department for the past five years, 1989-1993. These data were sorted for several main characteristics, in order to identify accident patterns.

In addition, SWITRS (State-Wide Integrated Traffic Record System) accident data for the past three years (1991-93) were analyzed. SWITRS is an accident database system compiled by the State Highway Patrol using accident reports from local jurisdictions. The SWITRS database includes statistics which are not summarized in the Police Department's database such as: the California Vehicle Code (CVC) violation (if any), party at fault, daylight or darkness, collision type and more detail about the victim: type (driver, passenger, bicyclist, pedestrian), age, sex, and extent of injuries. The SWITRS database lists a total of 1,078 bicycle accidents between 1991 and 1993. The consultant and the SF Bicycle Coordinator would like to acknowledge Tim Roach of the City of Santa Cruz, without whose help this analysis of SWITRS data would not have been possible.



EXISTING ROUTES

- 1 - Francisco
- 2 - Golden Gate
- 3 - Pacific
- 4 - Cabrillo
- 5 - GG Park
- 6 - Market
- 7 - Mission
- 8 - Kinnear
- 9 - Vicente
- 10 - Lake Merced BP
- 11 - Sunset BP
- 12 - 20th
- 13 - CENTERLINE
- 14 - OCEANSIDE
- 15 - DIAGONAL
- 16 - Embarcadero
- 17 - BAYSIDE
- 18 - Geneva
- 19 - Outer Mission
- 20 - Polk
- 21 - Webster
- 22 - Baker
- 23 - Noe Valley
- 24 - Park Presidio

ATTRACTORS

- Colleges or Universities
- High Schools
- Hospitals or Medical Ctrs
- Regional Rec areas
- City Rec Ctrs or Parks
- Regional Retail or Commercial Office areas
- Government
- ☆ Regional Transit Connection

FIGURE 2-2 LOCATION OF BICYCLE TRIP ATTRACTORS & GENERATORS

Finally, the San Francisco Department of Public Health's report *Profile of Injury in San Francisco*, March, 1994, was reviewed for pertinent information regarding bicycle injuries.

The SWITRS database is very useful as it categorizes bicycle accidents by several statistics not included in the SFPD's database. However, SWITRS data is not complete: SWITRS lists 1,078 reported accidents for the three-year period 1991-1993 while SFPD statistics indicate 1,445 reported accidents.

On the other hand, the existing accident summary database used by the SFPD also has some shortcomings. Under "directional code," which describes the movement of vehicles prior to the accident, there is a catch-all category for "collision with bicycle, streetcar, train, etc." Thus, the type of bicycle accident—left-turn, rear-end, head-on—cannot be determined from the database summary.

It is recommended that in a car-bike collision a bicycle be treated as a second vehicle, and a type (#1-26) should be selected to describe the accident. Thus, bicycle should be eliminated from Code B (Directional Indicator Codes #43 and 50). Codes 1-26 should not reference motor vehicle, and bicycles should be considered a vehicle for the purpose of accident analysis. In addition, it is recommended that the SFPD's computerized accident summary database be revised to provide the following information:

- ▶ Party-at-fault;
- ▶ CVC section violated; and
- ▶ Age of victim.

The party-at-fault and CVC section violated can replace the existing category of "cause" and will provide more accurate data than either the existing SFPD database summary or the SWITRS data base.

Accident Trends

Between 1989 and 1993, there were 35,239 total vehicle accidents and 2,353 accidents involving a bicyclist. The trend of bicycle accidents from 1989 to 1993 is illustrated below:

Table 2-1 BICYCLE ACCIDENTS AND TOTAL ACCIDENTS 1989-1993						
Number of Accidents	1989	1990	1991	1992	1993	Total
Total	12,621	13,767	13,105	12,834	12,109	64,436
Involving Bikes	424	484	469	496	480	2,353
Percent of Bike Accidents of Total Accidents	3.36%	3.52%	3.58%	3.86%	3.96%	3.65%
Source: City of San Francisco Accident Records.						

The number of bicycle accidents per year appears to have remained relatively steady, with between 424 and 496 reported bicycle accidents per year. They have remained particularly constant in the last four years, ranging from 469 to 496 per year. The number of reported motor vehicle accidents has decreased slightly in the past five years. Thus, the proportion of bike accidents to total accidents has increased from 3.4 percent to almost 4 percent.

Public Health Records

Motor vehicles cause thirteen percent of all injury deaths in San Francisco and seven percent of all injury hospitalizations. Two percent of the deaths caused by motor vehicle crashes are bicyclists and three percent of these hospitalizations are bicyclists. In comparison, the proportion of motor vehicle crashes that resulted in pedestrian death and hospitalization are 25 percent and 32 percent, respectively, and the motorcycle deaths and hospitalizations are 3 percent and 27 percent, respectively (see table below).

DEATHS AND HOSPITALIZATIONS DUE TO MOTOR VEHICLE ACCIDENTS IN SAN FRANCISCO				
Resulting in	Bicyclist	Pedestrian	Motorcyclist	Motor Vehicle Occupant
Hospitalizations July 1990 - June 1991	3	32	27	38
Deaths 1986 - 1991	2	25	3	70
Source: <i>Profile of Injury in San Francisco</i> , March 1994, S.F. Dept. of Public Health				

Of emergency room visits to San Francisco General Hospital in 1992, five percent were bicyclists, a slightly greater proportion than overall injury hospitalizations due to motor vehicle crashes. The "*Profile of Injury*" also analyzed paramedic calls to bicycle injuries in 1991.⁽¹⁾ Of the 164 911 responses to bicycle injuries, 122 or 74 percent involved an automobile. Geographically, these 911 injury accidents were clustered along Market Street in the Financial District, Civic Center and Upper Market area as well as in the Western Addition and the Haight-Ashbury areas. The report concluded that bicyclists between the ages of 20 and 30 are at the greatest risk for hospitalization from a motor vehicle collision.

Analysis of Reported Bicycle Accidents

High Accident Locations - The Department of Parking and Traffic (DPT) has identified the 1993 High Accident Locations - those with eight or more reported accidents of any type in the year 1993. In 1993, there were 63 intersections with eight or more accidents, 34 intersections with ten or more accidents and twelve intersections with fifteen or more accidents. This list is presented in Appendix A. The intersections with the highest number of bicycle accidents were identified by analyzing the SF Police database. Fourteen intersections experienced five or more reported bicycle accidents in the last five years. These locations are depicted in Figure 2-3. Over half of these

⁽¹⁾ *Profile of Injury*, Page 53.

locations are on either Market Street or Mission Street (five on Market Street and three on Mission Street).

There was some overlap between these two subsets of intersections, but most bicycle accident locations were not on DPT's High Accident Intersection list. The three high bicycle accident intersections that were on DPT's High Accident Intersection list are:

- ▶ 5th and Folsom
- ▶ Bay and Columbus
- ▶ Duboce and Valencia

The accident types at the fourteen high bicycle accident locations were reviewed in more detail. While the specifics of each individual accident were not examined, some general trends were discerned. In virtually all cases, the bicyclist is the party most severely injured. Two of the most common accident types involve the running of a red light by either a bicyclist or motorist and left-turn accidents. Measures that would potentially reduce accidents caused by running red lights range from longer red clearance intervals to more enforcement to creating attractive bike routes on streets with fewer cross streets, less traffic, less congestion, and thus fewer potential conflicts at intersections.

Left-turn accidents are common at both signalized and unsignalized intersections and are usually the fault of the motorist. At signalized intersections, both the motor vehicle and the bicyclist may be trying to take advantage of the yellow time. Another factor in some collisions may be the fact that the downgrades at some intersection approaches allow a bicyclist to travel at speeds of 25 to 35 mph. Motorists are accustomed to judging bicycle traffic at speeds of 10 to 15 mph. In general, hurried decisions or inattention on the part of the motorist contributes to the motorist misjudging bicycle speeds and causing accidents.

Motorist education about bicycle travel speeds would help reduce this type of accident. Signs reading LEFT TURNS YIELD TO BICYCLES or a similar message may be appropriate for limited application such as at the intersections which have the most conflicts. A more restrictive but more effective measure to reduce left-turn accidents would be to have protected left-turn phasing or to prohibit left-turns. Specific recommendations for improving intersection safety will be presented under the enforcement, education and implementation elements of the plan.

Fatalities and Injuries - The intersections that were the sites of fatal bicycle accidents were identified on Table 2-2. In the past five years, there were ten fatal bicycle accidents. These occurred at ten different intersections. None of these intersections were identified as High Bicycle Accident Locations. Several pertinent statistics about the fatal accidents are summarized in Table 2-2. One fatal accident occurred in 1989, two in 1990, four in 1991, one in 1992 and two in 1993. Two of the ten fatal accidents were single bike accidents, two involved a bike/truck collision, one involved a bike/bus collision, four involved a bike/car collision, and one involved a bike/pick-up truck collision. Seven of the victims were adults, one was a thirteen year old, and the ages of the other two were not available. It is not known how many of the victims were wearing helmets.



Table 2-2
SUMMARY OF FATAL BICYCLE ACCIDENTS
 1989-1993
 San Francisco Bicycle Plan

Location	Year	Age of Bicyclist	Type of Collision	Party at Fault	Time of Day	Reported Cause	CVC Violation	Other
Gough/Eddy	1993	31	Sideswipe: Car-Bike	Bicyclist	7:42P	Speeding bicyclist hit vehicle turning right	22350 21755	---
California/Montgomery	1993	21	Other: Bike only	Unknown	10:00A	Unknown	None	Single bike accident
Dalewood/Lansdale	1992	13	Hit fixed object: Bike only	Bicyclist	2:15P	Hit curb after steep downhill	22350	Single bike accident
19th Street/Wawona	1991	Unknown	Sideswipe: bike-tractor trailer	Bicyclist	1:30P	Unsafe turn - bicyclist veered into tractor-trailer	22107	---
Market east of/Sutter	1991	46	Sideswipe: bike-truck	Bicyclist	2:56P	Passing on right when unsafe	21755	Bicyclist carrying junk
Hyde/Sutter	1991	29	Broadside: bike-bus	Bicyclist	5:03P	Failure to stop behind Xwalk at red light	21453A 22350	On red light hit bus
Fell, east of Baker	1991	26	Head-on: car-bike	Bicyclist	10:30P	Bike turned wrong-way on one-way street	21657	Driver cited - DUI
26th Ave./Kirkham	1990	68	Broadside: car-bike	Driver	3:15P	Parked vehicle started when unsafe	22106	Driver not cited
Divisadero/Page	1990	Unknown	Broadside: car-bike	Bicyclist	12:10A	Ran STOP sign	22450	---
John Muir/Lake Merced	1989	35	Rear-end: pick-up/bike	Driver	8:00P (dusk)	Unsafe speed	22350	Hit and run, driver not cited

CVC = California Vehicle Code
 Source: S.F. Traffic Collision Reports.

Wilbur Smith Associates; January 1995



key	ROUTES	CYCLING ACCIDENTS
1	Francisco	☆ = less than 5 at an intersection
2	Golden Gate	✿ = 5 at an intersection:
3	Pacific	• Columbus/Bay
4	Cabrillo	• Van Ness/Turk
5	GG Park	• Mission/4th
6	Market	• Folsom/5th
7	Mission	• Market/2nd
8	Kirkham	★ = more than 5 at an intersection:
9	Vicente	• Mission/2nd
10	Lake Merced BP	• Market/New Montgomery
11	Sunset BP	• Scott/Haight
12	20th	• Masonic/Fell
13	CENTERLINE	◆ = largest amount = 17:
14	OCEANSIDE	• Market/Valencia/Gough
15	DIAGONAL	✚ = 5 occurring at mid-block:
16	Embarcadero	• Market St @ Powell (cable car turnaround)
17	BAYSIDE	• Market St @ 5th - Mason
18	Geneva	
19	Outer Mission	
20	Polk	
21	Webster	
22	Baker	
23	Noe Valley	
24	Park Presidio	

The police reports attributed the party at fault in two of the fatal accidents to be the motor vehicle driver. In the first case the cause of the accident was a parked vehicle starting when unsafe. In the second case, the cause was the motor vehicle travelling at an unsafe speed. In neither case did the driver receive a citation.

The causes of the remaining eight accidents were attributed to the bicyclists. A bicyclist travelling at an unsafe speed was considered a primary or contributory factor in three collisions, running a STOP sign was the primary cause of one collision, passing on the right was a primary factor in two collisions, turning the wrong-way onto a one-way street was the primary factor in one collision, and a bicyclist veering into and side swiping a tractor trailer reportedly caused one collision. It should be noted that the bicyclist's version of the accident is not provided in these eight reports as they were all fatal collisions. The causes of the accidents were determined by the officers on the scene after interviewing the motor vehicle drivers and the witnesses to the accidents.

In addition to these ten accidents, there were 48 accidents that resulted in two or more injuries. These 48 accidents occurred at 47 different intersections, so no trend was discerned from the multiple injury accidents.

Extent of injury data was obtained from the SWITRS database. 1.4 percent of all bike collisions involved property damage only—no injury. In the three year period, there were eight fatal accidents, (0.7 percent) and 44 severe injury accidents (4.1 percent). 53 percent resulted in other visible injury and 42 percent resulted in complaint of pain, the two least severe categories of injury. Non-injury accidents typically are not reported.

Age of Bicyclist - Of the 1,078 accidents reported by SWITRS between 1991 and 1993, 836 or 81 percent involved a bicyclist over age 17. Seventy-seven accidents or 7.5 percent involved a bicyclist between 13 and 17, and 8.5 percent involved a bicyclist under age 13. The preponderance of adult accident victims may not indicate that children are safer bicyclists than adults, but rather that there is a smaller percentage of children relative to adults who bicycle in San Francisco. Over half of adult victims, (45.1 percent of the total victims) are between the ages of 20-29. This is consistent with the conclusion of the *Profile of Injury* report. Over one-quarter of adult victims (23.1 percent of the total) are between the ages of 30-39. Four percent are either 18 or 19, six percent are 40-49 and 2.7 percent of the total are 50 years of age or older.

Temporal/Seasonal - Most bicycle accidents (78 percent) occurred during daylight hours. Sixteen percent occurred at night, and three percent occurred either at dusk or dawn. The two-hour period that had the most frequent bicycle accidents was 4:00-6:00 PM. These are also the hours with the highest volume of traffic. The next most common hours during which bicycle accidents occurred were those beginning at 2:00 PM, 3:00 PM and 12:00 Noon.

More bicycle accidents occurred during the spring, summer and fall, than during the winter months. The months with the highest number of accidents were September, August, October and April, with between 220 and 234 accidents over the five-year period. The months with the lowest number of accidents were January, February, March and December, with 150, 170, 176, and 177 accidents over the five-year period, respectively. This is perhaps due to lower bicycle use in winter. Many more accidents occurred on weekdays than weekends. Due to holidays, the average accident rate for Mondays was less than on other weekdays, but more than on weekends. Tuesday through Friday averaged between 380 and 395 bicycle accidents, while Saturday and Sunday had 246 and 250

accidents for the five year period, respectively. These data suggest that more accidents occur while commuting than while riding for recreation.

CVC Violations and Party at Fault - Of the 1,078 accidents in the SWITRS database, a CVC violation code was cited in 1,072 cases. The party at fault was listed as the bicyclist in 530 incidents (49 percent), the driver or parked vehicle was listed as the party at fault in 37 percent of the cases, the pedestrian was listed at fault in two percent of the cases, and no party at fault was identified in 11 percent of the cases. While bicyclists were at fault in about half of the accidents resulting in bicyclist injury, motorists were at fault in almost two out of five accidents. These statistics indicate that both bicyclists and motorists need to improve their driving behavior in order to increase the safety of bicyclists on San Francisco streets.

The most commonly violated CVC sections (primary cause of fifty or more accidents in the last three years) are listed in Table 2-3 for the years 1991-1993. They are broken down by auto-at-fault or bike-at-fault. The five most common vehicle code violations (by either a motor vehicle or bicyclist) resulting in a bicycle accident are listed below. The number of accidents attributable to each CVC violation is in parentheses.

- ▶ Unsafe speed (104 accidents)
- ▶ Stop at red light (86 accidents)
- ▶ Opening car door when unsafe (86 accidents)
- ▶ Yield to approaching traffic (74 accidents)
- ▶ Failure to yield when turning left (56 accidents)

The five most common vehicle code violations resulting in a bicycle accident caused by an automobile driver are: (in this order):

- ▶ Opening car door when unsafe (86 accidents)
- ▶ Failure to yield when turning left (53 accidents)
- ▶ Unsafe turn and/or without signaling (36 accidents)
- ▶ Unsafe speed (35 accidents)
- ▶ Stop at red light (28 accidents)

As indicated above, "**Motorists opening car door when unsafe**" is the most common cause of reported bicycle accidents caused by the motorist. This is followed by "**motorist making unsafe left-turns**", followed by "**motorists making unsafe turns**". It should be noted that there is not a specific CVC section for making an unsafe right-turn, as there is for an unsafe left-turn. CVC 22107 (unsafe turn, the third most common cause of motorist at fault bicycle accidents) is a catch-all category that includes unsafe right-turns as well as veering unsafely to the right or left when proceeding down the street. (In addition, CVC section 21451a covers the situation of proceeding at a green light (through, right or left) and not yielding to vehicles or pedestrians lawfully within the intersection). Therefore, it would be necessary to review each of the accident reports involving a CVC 22107 violation to determine the number of bicycle accidents that were caused by a right-turning motorist failing to yield to a bicycle proceeding parallel to the motorist.

In any case, when violations of CVC 21801a and CVC 22107 are added together, motorist making unsafe turns becomes the most common type of reported bicycle accident caused by a motorist.



Table 2-3
SUMMARY OF BICYCLE ACCIDENT DATA BY VIOLATION BY PARTY AT FAULT
(SWITRS, SAN FRANCISCO, 1991-1993)
San Francisco Bicycle Plan

Description of Violation	CVC Section Violated	Number of Accidents				
		Total	Driver at Fault		Bike at Fault	
			#	%	#	%
Unsafe speed for prevailing conditions	22350	104	35	34	69	66
Stop at limit line at red light	21453-a	86	28	33	58	67
Opening car door when unsafe	22517	86	86	100	0	0
Yield to approaching traffic	21804-a	74	10	14	64	86
Failure to yield when turning left	21801-a	56	53	95	3	5
Passing on right when unsafe	21755	60	1	2	59	98
Failure to stop at limit line at STOP sign	22450	59	13	22	46	78
Bicycle to operate in same direction as motor vehicles	21650	56	5	9	51	91
Unsafe turn and/or without signaling	22107	49	36	73	13	27
Changing lanes when unsafe	21658-a	38	14	37	24	63
Starting or backing when unsafe	22106	34	26	76	8	24
Failure to yield when entering highway	21802-a	18	10	56	8	44
Failure to yield to pedestrian in crosswalk	21950-a	17	5	29	12	71
Driving under the influence	23152-a	18	6	33	12	67
Improper position for a right-turn at intersection	22100-a	4	3	75	1	25
Improper position for a left-turn at intersection	22100-b	12	3	25	9	75
Proceed at green light but yield to pedestrians/vehicles lawfully in intersection	21451-a	14	11	79	3	21
Unsafe pass on the left	21750	12	6	50	6	50
Driving on sidewalk	21663	13	0	0	13	100
	Other	118	47	40	71	60
TOTAL		928	398	37*	530	49*

SWITRS = State-Wide Integrated Traffic Record System

CVC = California Vehicle Code

* = Percent based on total bike accidents regardless of fault, i.e. denominator of 1,072 not 928.

Wilbur Smith Associates; January 1995

The five most common vehicle code violations resulting in a bicycle accident and caused by a bicyclist are (in this order):

- ▶ Unsafe speed (69 accidents)
- ▶ Yield to approaching traffic (64 accidents)
- ▶ Passing on right when unsafe (59 accidents)
- ▶ Stop at red light (58 accidents)
- ▶ Wrong-way riding (51 accidents)

Unsafe speed and failure to yield to approaching traffic are the two most common reasons for accidents caused by bicyclists. Passing on the right when unsafe is the third most common cause. When CVC 21755 is combined with CVC 22107 (assuming all the latter accidents were right-turns), right-turns and passing on the right becomes the most common cause of a bicycle accident regardless of party at fault. The SFPD was contacted for clarification of the rights and responsibilities of the motor vehicle and the bicyclist in a right-turning situation. If the vehicle turns right into a bicycle that is on its right side or ahead of him, the fault lies with the vehicle, and the vehicle may be cited for CVC 22107 (unsafe turn). But if the vehicle is clearly ahead of the bicycle and waiting to turn right with its turn signal on, and the bicyclist passes the stopped vehicle on the right and is hit, the primary cause of the accident is attributed to the bicyclist—CVC 21755, unsafe passing on the right. Due to street geometrics and traffic, it is clear that many bicyclists feel they have no choice but to pass on the right. But the current California Vehicle Code expects bicyclists to wait behind a right-turning vehicle or to pass on the left as a motor vehicle would.

Bicycle Infractions - The bicycle infractions received by bicyclists between 1991 and 1993 were compared to the CVC section cited as the primary cause of bicycle accident when the bicycle was at fault. This comparison is shown in Table 2-4.

Over half of the infractions are for running a red light, and 11 percent are for running a STOP sign. No other one category contained more than three percent of the infractions. When compared to the primary cause of an accident, running a red light was responsible for eleven percent of accidents and running a STOP sign was responsible for nine percent of accidents.

Running a red light is one of the most visible types of bicycle misbehavior and it is easy to see why it is by far the most frequently enforced violation. However, several other actions by bicycles are responsible for the same proportion of accidents as running red lights, i.e. passing on right when unsafe, wrong-way riding, and not yielding to approaching traffic. More discussion on enforcement issues will be presented in Chapter 9: Safety Education and Enforcement.

EXISTING BICYCLE PROGRAM ADMINISTRATION

Currently, the implementation of the City's bicycle facility program crosses the jurisdiction of various City departments. Elements of the City's program take place in the Departments of Parking & Traffic, City Planning, Public Works, Recreation and Parks, and Police. The Department of Parking & Traffic (DPT) established a Bicycle Coordinator position in the Department of Parking & Traffic in July 1992 to direct bicycle improvements, coordinate with the Bicycle Advisory Committee (BAC) and pursue funding for bicycle programs.



Table 2-4
BICYCLE INFRACTIONS COMPARED TO PRIMARY CAUSE OF BICYCLE ACCIDENT
(SWITRS, SAN FRANCISCO 1991-1993)
San Francisco Bicycle Plan

Description of Violation	CVC Section Violated	Bicycle Infractions		Bike Accidents- Bike at Fault	
		#	%	#	%
Unsafe speed for prevailing conditions	22350	3	0	69	13
Stop at limit line at red light	21453 a	336	53	58	11
Lights at night	21201 d	11	2	0	0
Yield to approaching traffic	21804	0	0	64	12
Failure to yield when turning left	21801	1	0	3	1
Passing on right when unsafe	21755	2	0	59	11
Failure to stop at limit line at STOP sign	22450	69	11	46	9
Bicycle to operate in same direction as motor vehicles	21650	6	1	51	10
	21657	16	3	12	2
Unsafe turn and/or without signaling	22107	1	0	13	2
Changing lanes when unsafe	21658 a	1	0	24	5
Starting or backing when unsafe	22106	0	0	8	2
Failure to yield when entering highway	21802 a	0	0	8	2
Failure to yield to pedestrian in crosswalk	21950 a	16	3	12	2
Driving under the influence	23152 a	0	0	12	2
Improper position for a right-turn at intersection	22100 a	0	0	1	0
Improper position for a left-turn at intersection	22100 b	2	0	9	2
Proceed at green light but yield to pedestrians/ vehicles lawfully in intersection	21451 a	1	0	3	1
Unsafe pass on left	21750	0	0	6	1
Driving on sidewalk	21663	8	1	13	2
	Other	157	25	59	11
TOTAL		630	100	530	100

SWITRS = State-Wide Integrated Traffic Record System

CVC = California Vehicle Code

Note: = The bicycle accidents did not necessarily result in an actual bicycle citation.

Wilbur Smith Associates; January 1995

The following section describes the role of the Bicycle Coordinator and identifies the planning, funding, and implementation activities currently involved in the administration of the City's bicycle program. Lastly, this section discusses issues for further consideration during the development and analysis of various coordination program options (including the existing organizational structure).

Role of the Bicycle Coordinator

The Bicycle Coordinator currently oversees the bicycle activities in San Francisco and is key to the administration of the bicycle facility program. The Bicycle Coordinator prepares grant applications to finance bicycle programs and projects. The coordinator works with various departments to plan, design and implement projects which have approved funding. The bicycle programs and projects that have been implemented or have received funding include, but are not limited to:

- ▶ The spot improvement program
- ▶ Restriping for widened curb lane
- ▶ Valencia Street bikeway project
- ▶ Bicycle commute route signage
- ▶ Class I facility maintenance
- ▶ Lake Merced bikeway project
- ▶ Loop detector markings
- ▶ Implementation of the Golden Gate Bridge camera
- ▶ Development of the Comprehensive Bicycle Plan.

The Bicycle Coordinator is the project manager for implementing bicycle projects funded by Transportation Development Act (TDA) funds.⁽²⁾ When the Bicycle Coordinator was hired in 1992, there was a 3-year backlog of TDA projects. At this time, the implementation of Transportation Development Act (TDA) projects is on schedule.

The coordinator also works closely with the Bicycle Advisory Committee (BAC)⁽³⁾ to develop and prioritize projects. The Bicycle Coordinator is a member of the Regional Bicycle Advisory Committee, the Caltrans District 4 Bicycle committee, and participates in planning efforts for Golden Gate Park and the Presidio.

Currently, the Bicycle Coordinator is classified as a Transit Planner III and is a Civil Service position within the Department of Parking & Traffic. The Coordinator has no assigned staff, except for temporary interns and the usual departmental clerical support. The continuation of the coordinator position is contingent in part upon the award of grants and future bicycle projects and programs.

⁽²⁾ Transportation Development Act (TDA) funds consist of Local Transportation Funds (LTF) and State Assistance (STA) funds. LTF is a state-authorized revenue source which returns 1/4 cent of retail sales tax revenues to the county of origin for transportation purposes.

⁽³⁾ The San Francisco Bicycle Advisory Committee (BAC) advises the City in the development of a plan for bicycle-related improvements and advises City officials on the expenditure of bicycle-related funds. The BAC's eleven members are appointed by the Board of Supervisors and serve 3-year terms.

Planning Activities

The Department of City Planning (DCP), the Department of Recreation and Parks (DRP), the BAC, and the Bicycle Coordinator participate in the planning of bicycle facilities and programs.

The DCP is currently rewriting the Transportation Element of the City and County Master Plan which will include policies regarding bicycle transportation. The Comprehensive Bicycle Plan, currently being prepared by Wilbur Smith Associates, will be the City and County's most comprehensive plan on the planning of bicycle facilities.⁽⁴⁾ The bicycle portion of the Transportation Element will include bicycle parking and facility requirements, the citywide bicycle route system, and general policies about the provision of bicycle facilities in new developments and in neighborhood plans. The DCP also reviews specific plan documents of areas such as The Embarcadero and the Presidio to determine whether bicycle travel is accommodated in their plans.

The DRP is involved in the update of the Recreation Element of the Master Plan. The Recreation Element includes the bicycle routes and related policies for parks within the City and County, including Golden Gate Park. Golden Gate Park has several levels of bicycle use: commuter, recreational using paths, and recreational using trails. The DRP, DPT and the DCP coordinate to provide an interface between the city bikeway system and the park bike routes. The DRP's role in bicycle planning activities within the park also includes designation of bicycle facility types, provision of bicycle parking, and determining mountain bike trail standards and locations.

The BAC takes a very active role in providing input to the City's bicycle program. The Bicycle Coordinator works closely with the BAC to identify and define projects that provide improvements to cyclists and that require funding and implementation. The BAC has an advisory role in developing the policies relating to bicycles, and, in some instances, has played an active part in identifying and planning projects and programs. For example, the BAC developed a proposed citywide bicycle route system, primarily commuter routes (to be evaluated as part of this study).

Some planning activities have not involved the Bicycle Coordinator, such as participation in the review and the planning of special projects such as those for the design of The Embarcadero. Due to time and budget constraints on the Bicycle Coordinator, the coordinator does not become involved in the review processes of every project, plan, and EIR which may have a transportation component. The Department of Parking and Traffic staff keeps bicycle issues in mind when reviewing planning documents and notifies the Bicycle Coordinator if there are specific bicycle issues to be addressed.

Funding Activities

The Bicycle Coordinator is in charge of the current process for applying for project funding. The Bicycle Coordinator, with the aid of the BAC, defines projects and potential funding sources. The coordinator prepares the grant applications, Board of Supervisors and Parking & Traffic Commission resolutions, and other documents necessary to execute the grants.

⁽⁴⁾ The Bicycle Comprehensive Plan will be the primary source for identification of bicycle transportation policies that will be incorporated into the Transportation Element.

Although the BAC sits in an advisory role, members often take an active role in pursuing funding, an unusual role for a citizens committee. The BAC sometime assists in providing input to grant applications since the Bicycle Coordinator's time is limited with the oversight of many projects.

The funding sources currently used for bicycle programs and projects in the City and County include various state, federal and regional funds. The Bicycle Coordinator has written grant applications and/or attained funding from each of the following sources:

- Approximately \$400,000 per year is available for bicycle and pedestrian projects in San Francisco County from TDA funds, of which about one-half is typically used for bicycle projects. Although the TDA funds do not have to be evenly split between bicycles and pedestrians, there has been an informal agreement between DPT and DPW that one-half of the funds would go towards bicycle projects and one-half of the funds would go towards pedestrian projects.
- Proposition 116 included approximately \$20 million for bicycle projects statewide on a competitive basis. Three San Francisco projects have been awarded funding. They are:
 - ▶ Median and street improvements along Valencia to provide widened curb lanes (\$285,000);
 - ▶ Installation of signage along all of the proposed bicycle commuter routes (\$85,000); and,
 - ▶ Restriping of streets to provide widened curb lanes (\$263,000).
- Proposition B, the 1/2-cent sales tax in San Francisco County (approved by voters in 1989 for a twenty year period), includes \$12.5 million for bicycle and pedestrian circulation. The \$12.5 million is allocated to three programs, one of which is for bicycle, pedestrian and disabled accessibility projects (Program 47). Per a Memorandum of Understanding between the Department of Parking and Traffic and the Department of Public Works (DPW), half of the Program 47 funds, or \$2.25 million, are earmarked for bicycle projects which will be administered by the Department of Parking and Traffic. Some of this money is currently being spent on bicycle projects such as the "Spot" Improvement Program and Comprehensive Bicycle Plan.
- AB 434 legislation allowed an assessment of \$4.00 per vehicle on auto registrations for air quality enhancing projects, which generates a total of approximately \$1.39 million in San Francisco County and \$13 million in the nine-county Bay Area. Forty percent of the funds is returned to the counties, in San Francisco's case the Transportation Authority. In 1993-94, this amounted to \$556,000 for San Francisco. Sixty percent or about \$7 million is distributed on a competitive basis to the nine-county Bay Area region. Applicants are limited to 10 percent of the available funds or \$700,000. In San Francisco, AB 434 has provided funds for the purchase of bicycle lockers and bicycles for the parking control officers.

- Office of Traffic Safety provides funds for safety training. The Bicycle Coordinator has taken training courses relating to bicycle safety that were paid for through this source.
- ISTEA funding for median relocation and street improvements on Lake Merced Boulevard to provide widened curb lanes.

Implementation Activities

As noted earlier, the Bicycle Coordinator oversees most of the bicycle activities in the City and County. These activities include the implementation of a wide range of projects. Projects that involve elements that are not typically managed by DPT, such as roadway reconstruction, are performed by other departments.

DPW implements bicycle projects involving roadway construction and, occasionally, operation and maintenance of bicycle lanes. When a project has been planned for construction, DPT and DPW negotiate a budget for design, construction and construction management of the project. DPT will then work order funds to DPW. For major construction projects, DPW would perform design and engineering services and put the project out to bid for construction. Only DPW has the authority to do construction projects, i.e. DPT could not hire a construction contractor. DPW would hire a contractor for construction of the project. DPT would provide an oversight role as the lead department of the project and would provide construction management.

A key implementation program is the "San Francisco Bicycle Facility Improvement Program". In 1994, the Transportation Authority granted \$100,000 to conduct the "Bicycle Spot Improvement Program" which is designed to enhance bicycle safety and encourage bicycling by implementing low cost improvements suggested by concerned cyclists (such as signage, pavement striping, rack installation, pavement maintenance, etc). The program provides improvement request forms in areas frequented by cyclists such as bicycle repair shops. The form is a postage-paid postcard on which a concerned cyclist may note a suggestion and the location of the suggested improvement. The postcard is returned to the Bicycle Coordinator who identifies the need for the improvement and contacts the appropriate department for implementing the improvement. The effectiveness of this program has been affected by the following:

- There is not sufficient staff to follow-up on the information that comes in on the cards;
- The program has not been promoted extensively and bicyclists are unaware of the full range of improvement recommendations the program attempts to solicit.

Other Activities

A variety of other activities related to bicycles in the City are discussed below.

- The Police Department is currently involved in a Citywide voluntary bicycle registration program to deter bicycle theft and help to identify the owners of recovered bicycles. The Bicycle Coordinator was not involved in the development of this proposed program.

- The San Francisco Injury Center is involved with the promotion of bicycle helmet use and has played an advocacy role in motor vehicle helmet use legislation. The Injury Center has been involved with the Office of Traffic Safety's Safe Cities Program in coordination with the Department of Public Health. The Injury Center has no current funding specific to promoting bicycle safety, although the center is interested in seeking grants to conduct safety programs and in working with City departments and organizations.
- With the Bay Area's and the State's clean air legislation, Transportation Demand Management (TDM) Coordinators of agencies and employers have a large role in promoting the use of alternatives to the single-occupant vehicle. Bicycling is one mode that has had little consideration in years past but is becoming a more viable, and promoted, mode in this era of commute alternatives. The TDM Coordinators, such as the City Employee Commute Coordinator, need to be aware of the activities in the City that will improve and increase the number of bicycle facilities, and thereby make bicycling a more viable choice of commute modes. The City's TSM Coordinator should be actively involved in the outreach program described in more detail in Chapter 10.

Bicycle Program Administration Issues

The City's bicycle program has become much more effective since the creation of the Bicycle Coordinator position. However, as the need for creating attractive options to the single-occupant automobile increases, the importance of the planning, development and operation of a strong bicycle program will increase. Chapter 4 recommends a program of coordination that will allow various bicycle-related activities to work together more effectively. Recommendations will include number of staff members, roles and classifications of the staff, committee involvement and department coordination.



3. RECOMMENDED BICYCLE NETWORK

OBJECTIVES OF THE BIKEWAY NETWORK

The major objective of the recommended bikeway network is to provide cyclists with the safest, most reasonable routes available in a very densely populated, congested, and hilly urban area. It is intended to attract cyclists who may otherwise be intimidated by hills and/or traffic. For this reason, many of the routes indicated are not the most direct way of traveling from one part of the City to another. However, they are safer, sometimes slower, and in most cases, flatter than other alternatives available. In a few cases, the most direct street is considered so essential, that even though it may have more traffic, it has also been recommended. Most of these routes are recommended for curb lane widening or the actual marking of a bike lane. The other major objective of the plan is to serve all areas of the City and all major attractors.

The identification of a citywide bicycle network will enable DPT to plan for and prioritize future improvements on these streets including resurfacing, abandoned railroad track removal, and installation of rubberized rail crossing surface improvements. It will also help DPT justify opposition to traffic engineering changes that would be detrimental to bicyclists, such as the installation of STOP signs, angled parking, and narrowing travel lanes to stripe through lanes, right-turn only or left-turn only lanes.

No overt distinction has been made in the recommended bicycle network between commute routes and recreational routes. Many routes which may seem to be primarily recreational are indeed used by commuters. As no distinction is made between motorists out for a Sunday drive and commuter traffic, the same philosophy should be applied to all bicycle facilities. Bike facilities should be provided to serve all potential users and designed to the highest possible standards.

It must be emphasized that along with designating these routes on a map and implementing the physical changes such as striping or traffic calming, there must be an on-street signing system guiding bicyclists along the route. The signing system should indicate the route number as well as the major destination that the route serves, particularly for routes that direct cyclists to a particular destination such as SF State University or City College. A discussion of signing is presented later in this chapter.

It is acknowledged that making improvements to facilitate bicycle travel may, in some instances, impact other modes. For example, restriping a street to eliminate one travel lane to provide bike lanes may impact the resulting level of service at intersections along that street. Alternatively, removing STOP signs along a street may in fact benefit the neighborhood, provided that the corresponding traffic calming measures are implemented to prevent non-neighborhood traffic from diverting to the street. San Francisco's transportation system is truly multi-modal, and vehicular travel, MUNI service and pedestrians were considered in designing the bikeway network. Hard decisions may have to be made if further analysis shows that a recommended bicycle improvement has a "significant impact" on another mode. In some cases, it may be possible to shift the recommended improvements to an adjacent street rather than the recommended street. However, it must be recognized by the decision makers that major bicycle improvements **are** needed in San

Francisco to provide bicyclists with the same level of **mobility** and **safety** as other travel modes in the City.

Furthermore, bicycle transportation has been significantly impacted in the past as San Francisco's transportation system evolved to its present state of narrow lanes, proliferation of STOP signs, and other conditions that are hazardous or inconvenient for bicyclists. Implementing these bicycle improvements should not be construed as impacting other modes but rather restoring the level of mobility and safety that bicyclists had before changes were made that significantly impacted bicyclists. These significant impacts to bicyclists were not documented at the time, let alone mitigated. As such, these improvements should be regarded as mitigation for past projects which emphasized automobiles and transit and which severely impaired a bicyclist's ability to travel in a safe and convenient manner.

Finally, it is acknowledged that many improvements will not be implemented immediately. Thus, the bikeway network has been divided into two phases. Phase I is composed of the relatively non-controversial projects that can be implemented with the current funds. Phase II is composed of the projects that may need more study before they are implemented or that will use future funds. Finally, options are presented that have not been assigned to Phase I or II. These are not recommendations so much as design options for the City to consider in order to make San Francisco as bicycle-friendly as possible. The recommended phasing of the proposed improvements is presented in Chapter 4.

CRITERIA FOR ROUTE SELECTION

In selecting routes for the Bikeway network, three factors were considered: the types of users, service to major attractions, and deterrents to cycling.

Users

The potential users of the bikeway system have been classified into two main categories: the experienced bicyclists, and the novice and/or casual adult bicyclists. Older children who have the knowledge and skill to ride in traffic can be placed into the latter category. Young children who need adult supervision to cross the street as a pedestrian are not included as potential users. Their recreational and educational needs have been addressed in the recreational element and safety element, respectively.

Most casual or novice adult bicyclists are intimidated by traffic and will ride either where there is little or no traffic or on a street with a bike lane. Some will not ride on a street with high traffic volumes no matter how wide the bike lane. The experienced adult bicyclist knows how to ride in traffic. This plan recommends facilities for both types of users, and in many cases, the same facility will be preferred by both user types.

A person using a bicycle for transportation often will need to use a major thoroughfare for at least a part of their trip. Some bicyclists are not intimidated by traffic and will choose to use a major thoroughfare for all or most of their trip. Thus, all major thoroughfares must be as conducive to bicycling as possible and should, therefore, be included as a subset of the bikeway network. General recommendations to make these streets more attractive to bicyclists are presented in Chapter 6 -

Traffic Calming, Chapter 5 - Design Standards, and Chapter 8 - Policies and Maintenance. Examples of such measures are to slow speeding traffic, reduce right-turn/bicycle conflicts, and maintenance procedures and policies, respectively.

Attractors

Routes have been selected to serve all the major neighborhoods as well as San Francisco's major attractions. These major attractions include but are not limited to:

- ▶ BART Stations
- ▶ Caltrain Depot
- ▶ Central Business District
- ▶ Civic Center
- ▶ Farmers Market
- ▶ Golden Gate Bridge
- ▶ Golden Gate Park
- ▶ Legion of Honor Museum
- ▶ Neighborhood Commercial Districts
- ▶ Pacific Medical Center
- ▶ SF City College
- ▶ SF General Hospital
- ▶ SF State University
- ▶ Union Square
- ▶ University of California San Francisco
- ▶ University of San Francisco

Bicyclists need to travel wherever any other citizens would travel. Anywhere there is motor vehicle traffic there will be bicycle traffic. Even though the above list has identified some of the attractors which should be served by the bicycle network, the need to provide safe bicycle conditions throughout the entire City cannot be ignored. Thus, safety improvements and maintenance procedures as recommended in Chapters 5 and 8 should be implemented on all city streets, not just those identified as part of the Bikeway Network.

Deterrents

Of the three factors considered in route selection—users, attractors, and deterrents—the deterrents are the factor that can be objectively evaluated. Each route was rated for several criteria that make bicycling on that street unsafe, difficult, or unpleasant. These are referred to as deterrents. These evaluations formed the basis for selecting one parallel route over another as well as in determining the need for improvements to that route.

In most cases, selection of the bicycle route required a compromise between selecting the most direct route and avoiding deterrents. The potential to improve the safety of the route was also considered in the selection of the route.

The criteria used to evaluate the proposed routes are:

- ▶ Heavy traffic volumes
- ▶ Narrow lanes
- ▶ Grades over 5 percent
- ▶ Bus/trolley/light rail/cable car conflicts
- ▶ Street parking characteristics

Certain deterrents, such as poor quality pavement or frequent STOP signs, are possible to mitigate by repaving or removing STOP signs as part of a traffic calming plan. Narrow traffic lanes can sometimes be widened by restriping the street. Other deterrents are more difficult to alleviate

without impacting existing traffic circulation. Improvements to these routes to improve bicycle safety are recommended, and the potential impacts of these recommendations on traffic and parking are cited.

LIABILITY ISSUES

According to a publication from the Bicycle Federation of America, there are two areas of potential liability in regard to bikeway designation:⁽¹⁾

1. Negligent designation or design; and
2. Defects or hazardous conditions along the route.

This publication concludes that the designation of a bicycle facility will have virtually no effect on the potential liability of the government entity which controls the facility. It also states that the single most important step that the City can take to reduce potential liability related to bikeway designation is to reduce accidents.⁽²⁾

The City is being proactive in this regard via its SPOT improvement program to identify and implement safety improvements that will in turn reduce injury to bicyclists. This program demonstrates that the City does respond to reports of hazardous situations, is sensitive to the needs of bicyclists, and is taking steps to improve their safety.

Conforming to all design standards not only reduces the risk of accidents but also potential liability. The Traffic Manual acknowledges that unique non-standard situations deserve unique treatment where justifiable within the limits of CVC 21400. Providing signing and striping over and above the design standards should not cause the City to face increased liability but rather should demonstrate that it is serious about reducing the risk of injury to bicyclists and exercising caution over and above the standard expected of a local agency. For the many situations that pose difficulty to cyclists for which there is no appropriate sign in the Traffic Manual to adequately convey a message or warning, a local agency has three choices:

1. Do nothing;
2. Use inadequate or inappropriate signs from the Traffic Manual or MUTCD; or
3. Develop a new sign to convey an appropriate message.

This plan recommends the latter approach, and specific recommendations are presented in Chapter 5.

(1) *Liability Aspects of Bikeway Designation, A Special Report*, by John W. English, Legal Consultant, Page 42. Bicycle Federation of America, April 1986.

(2) *Ibid*, page 53

BIKEWAY IMPROVEMENT CLASSIFICATIONS

The recommended routes have been classified into five bikeway types, expanding on the standard three classifications identified in the California Highway Design Manual. These additional categories were used to provide more information about the specific types of improvements recommended for the master bikeway system. These bikeway types are described below:

- Class I = Bike path
- Class II = Bike lane
- Bicycle Priority Street/TC = Bike priority street through traffic calming
- Wide Curb Lanes = Bike route with wide curb lanes
- Class III = Bike route - improvements vary

Bike Path

For the most part, the existing bike paths in San Francisco are multi-use trails. Due to the heavy volumes of non-bicycle traffic, they are often not effective as true "Bike Paths". Depending on the time of day or day of week, they may or may not be usable for a leisurely ride; they are often unusable for a fast-paced bicyclist. This plan recommends that all existing bike paths be widened to at least 12 feet or more where feasible. Feasibility will be affected by costs and environmental impacts which are beyond the scope of this study to assess.

In addition, this plan recommends new paths to connect sections of the bike routes through parks or other areas. Guidelines for bike path cross-sections are presented in Chapter 5.

Class II Bike Lanes

For the bicyclists who are intimidated by traffic, bike lanes on major streets will encourage them to bicycle. Bike lanes provide a continuous visual reminder to motorists to expect bicycles along a street. Bike lanes also help to assign the available roadway width to bicyclists, thereby reducing the chance that it will be usurped by future roadway widening or restriping.

Bike lanes have been recommended only when they can be maintained for the length of a street, and only when they make sense in terms of the street's traffic volumes. Low volume streets do not need striped bike lanes even if the width is available, for there is ample opportunity for a car to easily pass a bicyclist. Even novice cyclists don't need a bike lane to feel safe on such streets. Research indicates⁽³⁾ that traffic levels of 3,000 - 4,000 vehicles per day for a 40-foot wide street with on-street parking do not require bike lane striping. Conversely, the heavier and faster the traffic, the wider the bike lanes should be. Criteria for bike lane widths are presented in Chapter 5. The street sweeping schedule was also reviewed before recommending bike lanes on a particular street.

⁽³⁾ Wilkinson, Bruce *Selecting Roadway Design Treatments to Accommodate Bicycles* FHWA Contract No. DTFH61-89-C-00088, November 10, 1992; Northwestern University Traffic Institute, *Program of Instruction for the Bicycle Planning and Facility Workshop*, October 1992.

For some bike lane recommendations in this plan, restriping to remove a travel lane is necessary for implementation. Consideration was given to the existing traffic volumes on these streets, the available capacity on alternate parallel routes and the available options for safe bicycle routes before such re-striping was recommended.

Wide Curb Lanes

In many instances, there is not physically room to stripe separate bike lanes. In these instances, the existing striping was evaluated to determine if the curb lane could be widened so that there would be more room for cars to pass bikes as safely as possible.

Where wide curb lanes are proposed, it is recommended that a pavement stencil be painted onto the roadway surface in conformance with the Design Guidelines presented in Chapter 5.

Bike Priority Streets - Traffic Calming

Many existing low-volume residential streets make excellent bike routes for novice or casual bicyclists. On such streets with low traffic volumes, striped bike lanes are not necessary. These streets can also be extremely attractive routes for both casual and experienced bicyclists if STOP signs are placed such that these streets have the right-of-way at most cross-streets. In order to prevent motor vehicle traffic from diverting to these streets, traffic calming techniques are recommended.

This plan recommends the inclusion of such streets in the recommended bikeway network as Bicycle Priority Streets. Thus, in the following discussion where traffic calming is recommended, it means by implication that STOP signs should be positioned such that travel along this street has the right-of-way, and traffic calming measures are recommended to prevent diverted motor vehicle traffic. A detailed discussion of appropriate Traffic Calming measures is presented in Chapter 6. The specific strategies to implement along a given street should be developed in conjunction with the residents of the specific neighborhoods as described in Chapter 6.

Class III Bike Routes

A road or roads may be recommended as part of the bikeway network even though no widening or other specific improvements will or can be implemented to accommodate bikes. Such Class III routes have an important function in providing continuity to the system, serving the entire City and connecting route segments, particularly when signed and maintained as part of the overall bikeway system. They are recommended where other bikeway types are not possible due to political or physical constraints. Class III bike routes should still be signed and marked with pavement stencils and signs indicating that cars and bikes are sharing the curb lane. (See Design Standards in Chapter 5.)

DESCRIPTION OF RECOMMENDED BIKEWAY NETWORK

The following presents a brief description of each of the recommended routes. The routes are presented in numerical order - east-west routes are listed first. In a few cases, there are several options to provide bicycle facilities, with different impacts on parking, traffic flow, traffic control devices, etc. In these cases, all the options are described and the preferred alternative is indicated. Also, in some instances, there may be actions the City could take to improve bicycle circulation along the route. These actions will be described, but it is beyond the scope of this report to develop these concepts further and to develop cost estimates for their implementation.

The recommended bikeway network is illustrated on the attached oversized map.

A summary of the characteristics of each recommended route is presented in Table 3-1 in the same order as presented in the text below. This table also contains conceptual cost estimates. These cost estimates are based on unit construction costs obtained from the Department of Parking and Traffic and the Department of Public Works. The base construction cost assumptions on which these cost estimates are based are presented in Appendix B. Recommended phasing and potential funding sources are presented in Chapter 4.

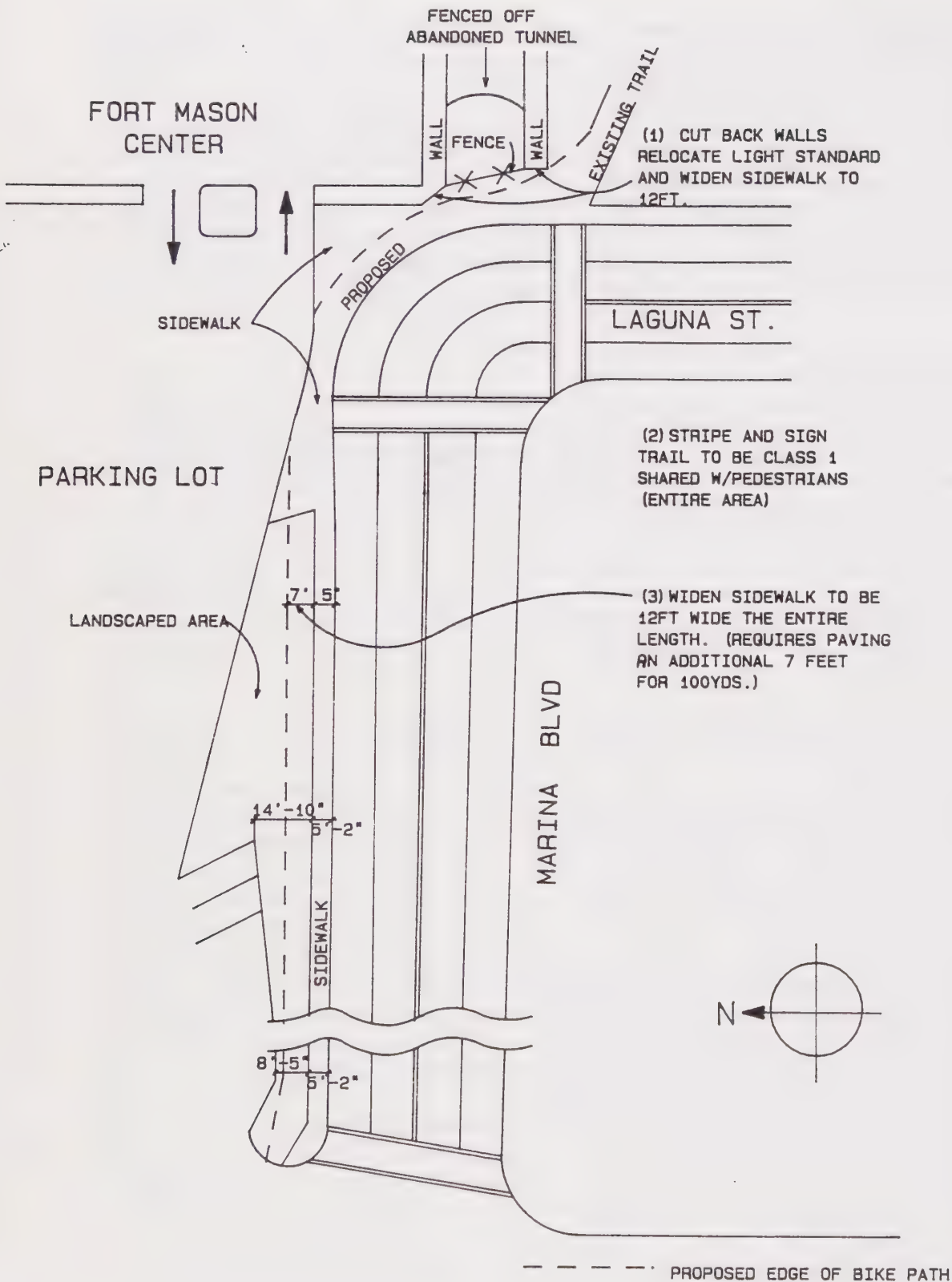
A summary of the public comments are presented in Appendix B. The map and text have been modified to incorporate public comments on the Bicycle Route Network. However, Table 3-1 and some parts of other chapters have not yet been updated to reflect these changes. The Final Report will fully incorporate the public comments on the Bicycle Plan.

Northpoint Street/Marina Boulevard/Old Mason Street

Northpoint Street should connect with the existing path behind Fort Mason via Van Ness Avenue. From Fort Mason, the route connects to Marina Boulevard then continues onto Old Mason Street into the Presidio and onto the Golden Gate Bridge. Along Marina Boulevard, two facilities are recommended. On-street bike lanes can be striped, given the existing curb lane widths between Webster Street and Baker Street. Also, given the high demand for access to the waterfront, a bike path is recommended by striping and/or widening the existing sidewalk from Laguna to Baker Streets. A separate bike path adjacent to the sidewalk can be provided between Buchanan and Scott Streets. Path widening is needed between Laguna Street and Buchanan Street and between Scott Street and Baker Street. The point where the existing path from Fort Mason joins Beach and Laguna Streets should also be widened. The paths within Fort Mason should be resurfaced and signed as necessary. A description of these recommendations is provided in Figure 3-1.

Francisco Street/Bay Street/Francisco Street/Lombard Street

This existing route is retained to provide access for the residents of the Marina to Polk Street and the Northpoint/Embarcadero routes. Due to the large number of STOP signs, this route could benefit from traffic calming, that is, the STOP signs should be removed and unwanted traffic intrusion should be prevented using traffic calming techniques. This route should connect with the Lombard Street entrance to the Presidio.



WSA

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PROPOSED TRAIL IMPROVEMENT AT
MARINA BLVD / LAGUNA ST

FIGURE

SAN FRANCISCO
BICYCLE PLAN

3-1

Under the current conditions, two-way STOP sign controlled intersections are interspersed with four-way STOPs, and cyclists travelling on Francisco Street can be off their guard when encountering the two-way STOPs. Thus, in the interim, it is recommended that the two-way STOP signs be supplemented with **CROSS TRAFFIC DOES NOT STOP** signs.

Greenwich/Octavia/Green

This route connects Pacific Heights south of Lombard Street to Polk Street and The Embarcadero via the Northpoint Street route. It avoids the steep hill on Greenwich Street between Van Ness Avenue and Polk Street. The Northpoint Street route is accessed via Octavia, Francisco, and Polk Streets. The southbound Polk Street route is accessed via Octavia and Green Streets. At the western end, the route connects to the Northpoint Street route at Lyon Street, where it also connects with the Lombard Street entrance to the Presidio. Due to the large number of stop signs, this entire route could benefit from being a series of Traffic Calming/Bike Priority Streets.

Broadway/Pacific Avenue/Clay Street/Lake Street/Clement Street

Broadway is recommended between The Embarcadero and Webster Street due to major grades on the parallel streets. The Broadway Tunnel, which solves the grade problem, presents other challenges to solve. Pacific Avenue is a good alternative in the eastbound downhill direction, but westbound the hills on Pacific Avenue are a significant deterrent, and Pacific Avenue is one-way westbound between Front Street and Powell Street. It is recommended that Pacific Avenue be the eastbound route between Polk Street and Powell Street. Westbound, Broadway is recommended as the tunnel avoids the steep grade between Mason Street and Larkin Street. To improve conditions for bicyclists through the Broadway Tunnel, the following are recommended:

- Designate the sidewalk in the westbound tunnel for bicyclists and advise pedestrians to use the sidewalk in the eastbound tunnel.
- Widen the sidewalk (existing width 3'11" to edge and 3'5" to rail) in the westbound tunnel by relocating the rail to be on the lower ledge. This would gain about 6 inches. In addition, seven fire hydrants would have to be relocated. Another 16 inches could be gained by reconstructing the existing ledge adjacent to the sidewalk to become part of the sidewalk. The resulting sidewalk width would be 5'3", less the width needed for the rail and occasional fire hydrant.
- To provide adequate shy distance for vehicles from the relocated rail, restripe both lanes in the westbound tunnel to be ten feet wide and stripe an edge line along the right side of the right lane to keep cars away from the relocated rail.

It is acknowledged that these are costly improvements for a relatively short length of route. In addition, there may be compliance problems in restricting pedestrians as well as westbound bicyclists to the westbound tunnel. These options are presented to document what could be done to provide safe bicycle access through the Broadway Tunnel. Needless to say, Russian Hill is a major barrier for bicyclists as well as motor vehicle traffic, and westbound bicyclists currently have no other options which avoid extremely steep grades.

- In the eastbound tunnel, the sidewalk should remain for pedestrians only. Eastbound bicyclists can be routed onto Pacific Avenue. Since bicycle travel in the tunnel on the roadway would still be legal, bicycle travel through the tunnel should still be made as safe as possible for bicyclists by:
 - ▶ Restriping the existing 11-foot-wide lanes so that the right curb lane is 12 feet and the left lane is ten feet; and
 - ▶ Install a push button activated flashing yellow beacon with a sign that reads: **BIKES IN TUNNEL WHEN LIGHTS ARE FLASHING**⁽⁴⁾

Clay Street is recommended as the route to continue into the Richmond District. From Clay, one can use Cherry Street and Jackson Street to Arguello Boulevard to enter the Presidio, or jog down to Sacramento Street then continue on Lake Street, where there is an existing bike lane between 3rd and 12th Avenues and 14th and 25th Avenues. There is a second connection into the Presidio at 15th Avenue.

California Street/Taylor Street/Pacific Avenue

This Nob Hill route connects to the Polk Street route and Pacific Avenue/Broadway to the north, it is the most gradual, practical ascent of Nob Hill. From Polk Street, it follows California, Taylor, Pacific, Powell, to Broadway. The return is from Powell Street, via Broadway (the one-way uphill block north of the tunnel and not the tunnel itself), Mason Street, Pacific Avenue, Taylor Street, and California Street to Polk Street. Warning signs should be installed at all cable car track crossings. The roadway surface at these crossings is smooth enough to make this a good route.

Sutter Street/Post Street

The Sutter Street/Post Street one-way couplet is recommended between Presidio Avenue and Market Street. The parallel streets to the north and south, Geary Street, Pine Street and Bush Street are designated major thoroughfares and Sutter and Post Streets have lower overall traffic volumes. The existing bus-only lanes are recommended to be shared with buses, bikes and right-turn vehicles. Although it is acknowledged that in most cases sharing lanes with buses is not ideal, many experienced cyclists would prefer to share a lane with only buses than with buses, cars, taxis, etc. In fact, bikes and buses are sharing the lane today. When one considers the alternative—bikes riding one lane over in the mixed flow lane, with buses on the right and cars to the left—one realizes that sharing the bus lane is the safest, sanest alternative for bikes and thus should be legitimized by the City. Several cities have already done so.⁽⁵⁾

⁽⁴⁾ Such treatment for bicycles in tunnels has been implemented in Oregon and in North Carolina.

⁽⁵⁾ The cities of Madison and Toronto have implemented shared bicycle, bus and right-turn lanes. Source: *Developing Guidelines for Co-Use of Roadways by Bicycles and Buses*, Pro-Bike Pro-Walk 94 Resource Book, Bicycle Federation of America.

However, if this is all that is done, this route will likely attract only experienced cyclists. The City should consider one of the following as a future improvement to improve the facility and attract more than just experienced bicyclists:

- Create a contra-flow bus lane on each street.⁽⁶⁾ This would put the buses on the left side of the street (from the perspective of the remaining traffic on the street). This would probably mean the elimination of parking on the bus side of the street. The right lane would then be available to be restriped as a bike lane; or
- Remove parking on Sutter Street and Post Street in order to stripe bike lanes.

Fifth Street/Turk Street/Golden Gate Avenue/Cabrillo Street

A major bikeway connection between Townsend Street and Market Street is needed. Fifth Street is recommended due to its central location between The Embarcadero and Van Ness Avenue and its relatively low bus volumes. By restriping 5th Street to have two northbound lanes and one southbound lane, 6-foot bike lanes can be striped. The adjacent streets appear to have enough capacity to absorb the diversion of southbound traffic. (Currently there is less southbound traffic than northbound traffic on Fifth Street.) From 5th Street the route continues along the proposed Market Street route to Turk Street and Golden Gate Avenue.

The one-way couplet of Turk Street and Golden Gate Avenue is recommended between Lyon Street and Market Street, as Turk is the only street near the Civic Center that is continuous between Market Street and the Richmond District. Turk should be restriped from three lanes to two, and a six-foot bike lane should be striped from Market Street to Masonic Avenue. The remaining four feet (from eliminating a ten-foot lane) should be used to widen the sidewalks to improve pedestrian safety. Similarly, Golden Gate Avenue should be restriped to eliminate a travel lane to have an eastbound bike lane. At Lyon Street, a southbound bike lane should be striped so that eastbound traffic can continue on Golden Gate Avenue. West of Lyon Street, the route would be two-way on Turk Street, since Golden Gate Avenue does not go through to Arguello Boulevard.

Cabrillo Street between Arguello Boulevard and The Great Highway should be designated a Bicycle Priority Street as described in Chapter 6. This route has less traffic, lower grades, fewer busses and less commercial frontage than Balboa Street.

Market Street/Corbett Avenue

Market Street is an extremely important route for bicyclists for the very same reasons it is an important transit route. The vast number of destinations and attractions along Market Street make it the generator of hundreds if not thousands of bike trips per day. (A recent bike count⁽⁷⁾ revealed 165 bikes during the PM peak rush hour at the intersection of Market Street and Van Ness

⁽⁶⁾ Contra-flow bus lanes are used successfully in Pittsburgh PA and other cities. See *Fundamentals of Traffic Engineering*, page 25-9, 13th Edition, Homburger, Wolfgang S.

⁽⁷⁾ San Francisco Federal Building Draft EIR, 1994.

Avenue.) Being the northern-most street with its orientation, it is essential to make it as bike friendly as possible.

Barring a total redesign of Market Street, the single most effective way to improve bicycling conditions on Market Street east of Duboce Avenue would be to prohibit cars. This would have other benefits also, which are beyond the scope of this report to analyze. Without cars, bikes and buses would have more room to share the limited roadway space, there would be fewer potential hazards from right-turning vehicles, and bikes could more easily pass buses on the left (as is required for safety and legally by the California Vehicle Code).

Trucks
A second measure that would improve conditions for bikes on Market Street, with or without the banning of cars, would be to install bicycle traffic signal heads, and to give bikes a 5-second advance green light over the motor vehicle traffic. This is especially important due to the large numbers of busses on Market Street whose average travel speed is about 7 mph, which is less than a bicyclist's average travel speed along arterials (approximately 10 - 15 mph). Giving bikes a 5-second head start would allow them to get permanently ahead of a bus instead of playing leap frog all the way down Market Street. This head start on the bus that the recommended signal timing would provide is precisely why many experienced bicyclists jump red lights. Most experienced bicyclists, once ahead of a bus, can stay ahead. This dramatically increases safety for bicyclists. It should be noted that 30 percent of the fatalities in the last five years (1990-1993) involved a bike collision with a bus or other heavy vehicle, and one bicycle fatality in 1994 involved a MUNI bus.

Market Street is recommended as a Bike Route from The Embarcadero to Duboce Avenue. Market Street has existing bike lanes striped from Duboce Avenue to Castro Street. Double parking is an existing problem in these (and other) bike lanes. See Chapter 8 for a discussion of this problem.

From Castro, westbound, 17th Street is recommended to Corbett Avenue. In the eastbound direction, the route uses Corbett Avenue until Eureka Street. Eureka Street is recommended for one block between 17th Street and Market Street in order to avoid the one-way segment of 17th Street. From Eureka Street, cyclists turn left on Market Street.

Duboce Wiggle/John F. Kennedy Drive

This is an extremely important connection, particularly in the westbound direction, between Upper Market Street and the Panhandle. Duboce Avenue between Market and Church Streets, an existing one-way eastbound street, will need to be converted to a two-way bikes-only lane. Vehicle traffic is currently required to turn right at Market Street anyway, so this should not cause any problems for traffic circulation. This one-block section may need to be shared with MUNI, however. Signing and signal timing may need to be modified so that eastbound bicyclists can turn left from Duboce Avenue onto Market Street.

The remaining streets between Church Streets and Scott Streets should receive some traffic calming treatment to prioritize the right and left-turns needed along this route. There are several alternative ways to travel through this area to connect Duboce Avenue/Church Street with Scott Street/Haight Street, and the exact route should be determined with the input of the neighborhood residents and the BAC.

Due to the significant grades (over 15 percent) on both Page and Haight Streets, the route must continue on either Oak Street or Fell Street for three blocks between Scott and Baker Streets. It is recognized that these are major thoroughfares for motor vehicle traffic, but there are **no** other options for bicycle traffic with grades under 10 percent.

The design alternatives to safely accommodate bikes on these three blocks are (preferred option is listed first):

- **Alternative #1** - Prohibit parking on the north side of Oak Street. Put two-way bike lane (10-12 feet wide) on Oak Street. (The north side is recommended in order that the bikes adjacent to traffic will be travelling in the same direction as traffic.) Left-turn phasing for bicycles is recommended to separate the bikes-through movement from the vehicular left-turn movement. This would probably involve bike signal heads. (The alternative to left-turn phasing is the prohibition of left-turns onto Baker Street, Broderick and Divisadero Street.)

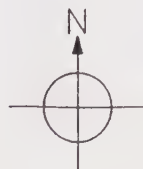
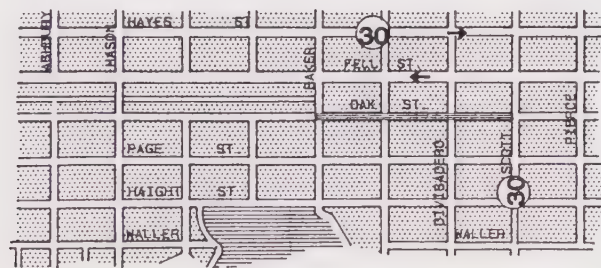
This is the preferred alternative because: 1) there are fewer driveways on Oak Street than on Fell Street; 2) Oak is used more heavily during the AM peak hour and Fell is used more heavily during the PM peak hour. Thus this option does not impact the capacity during the PM peak hour, which is generally considered more critical than the AM peak hour; and 3) Oak Street is closer for those living in the Haight/Ashbury district and the Sunset and not any further for those living north of the Panhandle.

This alternative would also involve the extension of a bike path from the corner of Oak Street and Baker Street to the existing bike path. A conceptual design of this alternative is depicted in Figure 3-2.

- **Alternative 2** - For westbound cyclists, prohibit parking on the south side of Fell Street. Stripe a 6-foot one-way bike lane, and give extra width to the right curb lane on Fell Street. For eastbound cyclists, prohibit parking on the south side of Oak Street and stripe a 6-foot one-way bike lane.
- **Alternative #3** - Prohibit parking on south side of Fell Street. Stripe 6-foot one-way bike lane, and give extra width to right curb lane on Fell Street. Eastbound bicyclists would use Page Street.
- **Alternative #4** - Prohibit parking on south side of Fell Street. Put two-way bike lane on Fell Street. Similar signal phasing would be required as described under Alternative 1.

Panhandle Bike Path - The intersection of the Panhandle bike path and Masonic Avenue should be made safer by the following actions:

- Modify signal phasing at Fell Street/Masonic Avenue to have left-turn signal phasing for westbound traffic. Bikes would receive a red indication during this time and would proceed when the left-turns face a red arrow.



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SAN FRANCISCO
BICYCLE PLAN

3-2

- Prohibit parking in advance of Masonic Avenue for 100-200 feet to improve visibility between westbound traffic and bikes on bike path. Use this area for left-turn lane required for left-turn phasing.
- Pave the bike path crossing at Masonic Avenue with special textured colored surface as described in Chapter 5 for bike path crossings of streets.

The Panhandle Bike Path itself should have better lighting as well as a few feet of extra width. Since there is no parallel pedestrian facility immediately adjacent to the bike path, pedestrians of course use the Panhandle bike path. It is recommended that a separate pedestrian path or sidewalk be built either adjacent to the bike path (which could meander to avoid the existing trees) or adjacent to Fell Street.

Fell Street/Stanyan Street - At the intersection of Fell Street and Stanyan Street, a bicycle-only phase is recommended. Related signing and striping recommendations are depicted in Figure 3-3.

John F. Kennedy Drive - On John F. Kennedy Drive, traffic calming techniques are recommended to slow traffic to 25 mph maximum speed. A variety of measures could be implemented as described in Chapter 6.

Kirkham Street/Sunset Spur - Kezar Path/Page Street

Kirkham Street is needed to serve the Sunset in an east-west direction. Traffic calming techniques should be explored to reduce the number of STOP signs along the route.

For bicyclists travelling west on the Panhandle path to the Sunset, a bike path should be built on the east side of Kezar Drive between John F. Kennedy Drive and Lincoln Way. The path would also be useful to cyclists travelling to Market Street from Kirkham Street in the Sunset. The two-way bike path would not cross any streets due to the proposed closure of Waller Street and Martin Luther King Jr. on the east side of Kezar Drive. At Lincoln, a traffic signal should be installed.

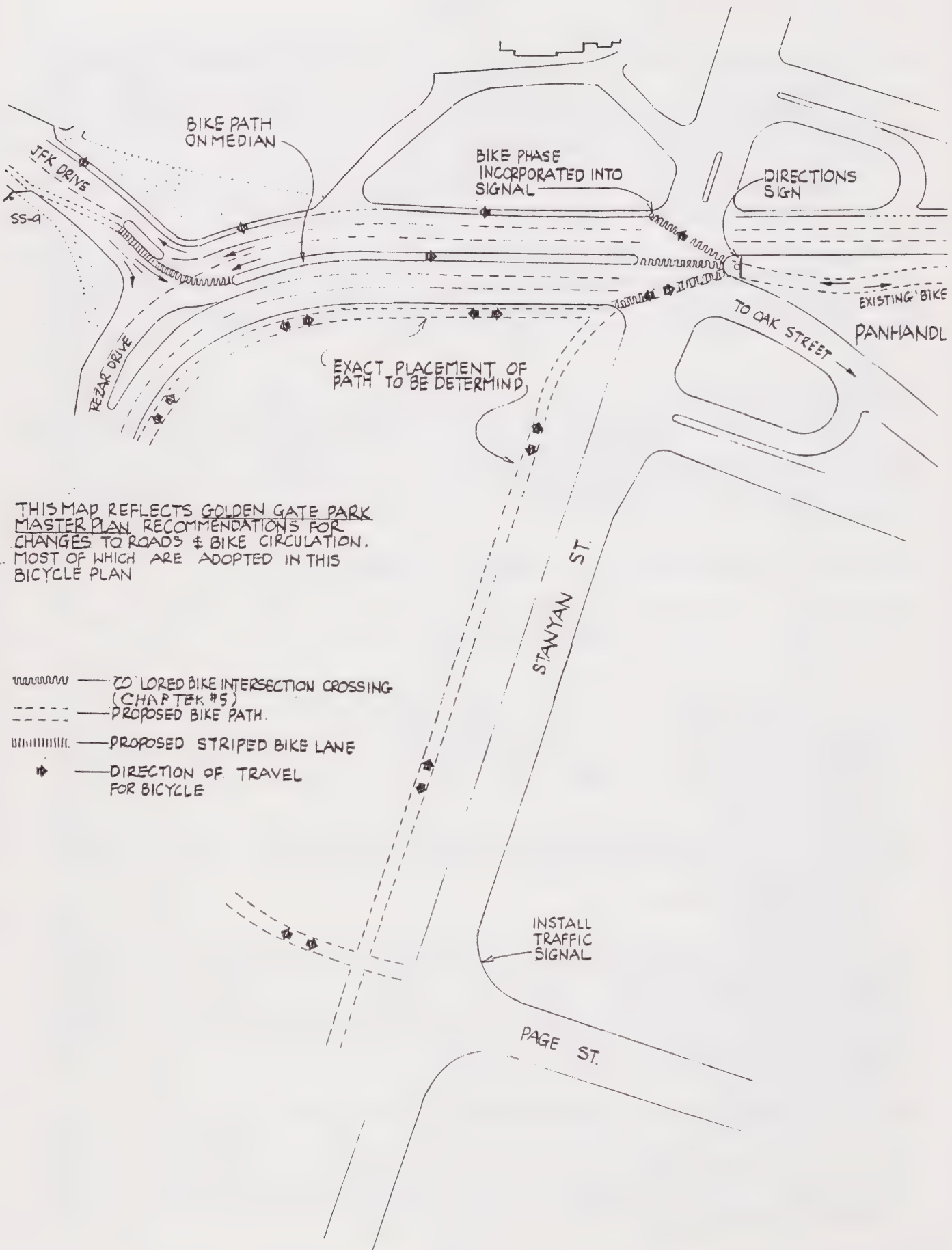
For eastbound bicyclists, Page Street is a wonderful straight shot to Market Street. This street, however, has numerous STOP signs, and thus is a perfect candidate for traffic calming treatment.

17th Street/16th Street

This route provides an important connection to The Mission and the 16th Street BART station. 17th Street is recommended between Castro Street and Kansas Street. Some traffic calming strategies may be used to eliminate STOP signs and provide a better ambiance for bicycles. Sixteenth Street is needed to connect to Third Street, as Seventeenth Street does not go through. Bike lanes are recommended on 16th Street. There is also a connection at 16th Street and Mississippi, south to Mariposa and east to Third Street.

Corbett Avenue/Jersey Street/Chattanooga Street/22nd Street

This route connects Upper Market, Noe Valley, and the Mission District (including San Francisco General Hospital). Starting at the Market Street/Corbett Avenue route at Corbett Avenue it proceeds east via Romain Street, across the existing non-vehicular over-crossing of Market Street,



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PROPOSED IMPROVEMENTS
AT FELL/STANYAN STREET

SAN FRANCISCO
BICYCLE PLAN

FIGURE

3-3

to Romain Street, Grand View Avenue, 21st Street, Eureka Street, 23rd Street, Diamond Street, Jersey Street, Chattanooga Street, 22nd Street, to the route on Potrero Avenue. By travelling south on Potrero, the cyclist can connect with the Army Street route. Since Diamond, Jersey, Chattanooga, and 22nd Streets are low traffic volume residential streets, it is recommended that these streets be Traffic Calming/Bike Priority streets along this route.

Army Street/Clipper Street/Portola Drive/Sloat Boulevard

A central east-west connection is essential, and unfortunately only available on relatively major thoroughfares, sometimes with steep grades. Thus Army Street, Clipper Street, Portola Drive and Sloat Boulevard have been selected to provide this needed connection. Army Street should be restriped to have wide curb lanes between Potrero and Guerrero Streets. This will necessitate the removal of the existing concrete median and the relocation of the existing light standards.

Recommendations to improve bicycling conditions through the Army Street/Highway 101 interchange are presented in Figure 3-4. This route continues on Army Street and jogs to Clipper Street on Sanchez Street. This route continues to the west on Portola Drive and Sloat Boulevard. Eastbound bicyclists can avoid the complicated triple left turn lane at the intersection of Sloat Boulevard and Portola Drive by continuing straight onto St. Francis Boulevard and turning left at San Fernando Way and then right onto Portola Drive.

O'Shaughnessy Boulevard/Woodside Avenue

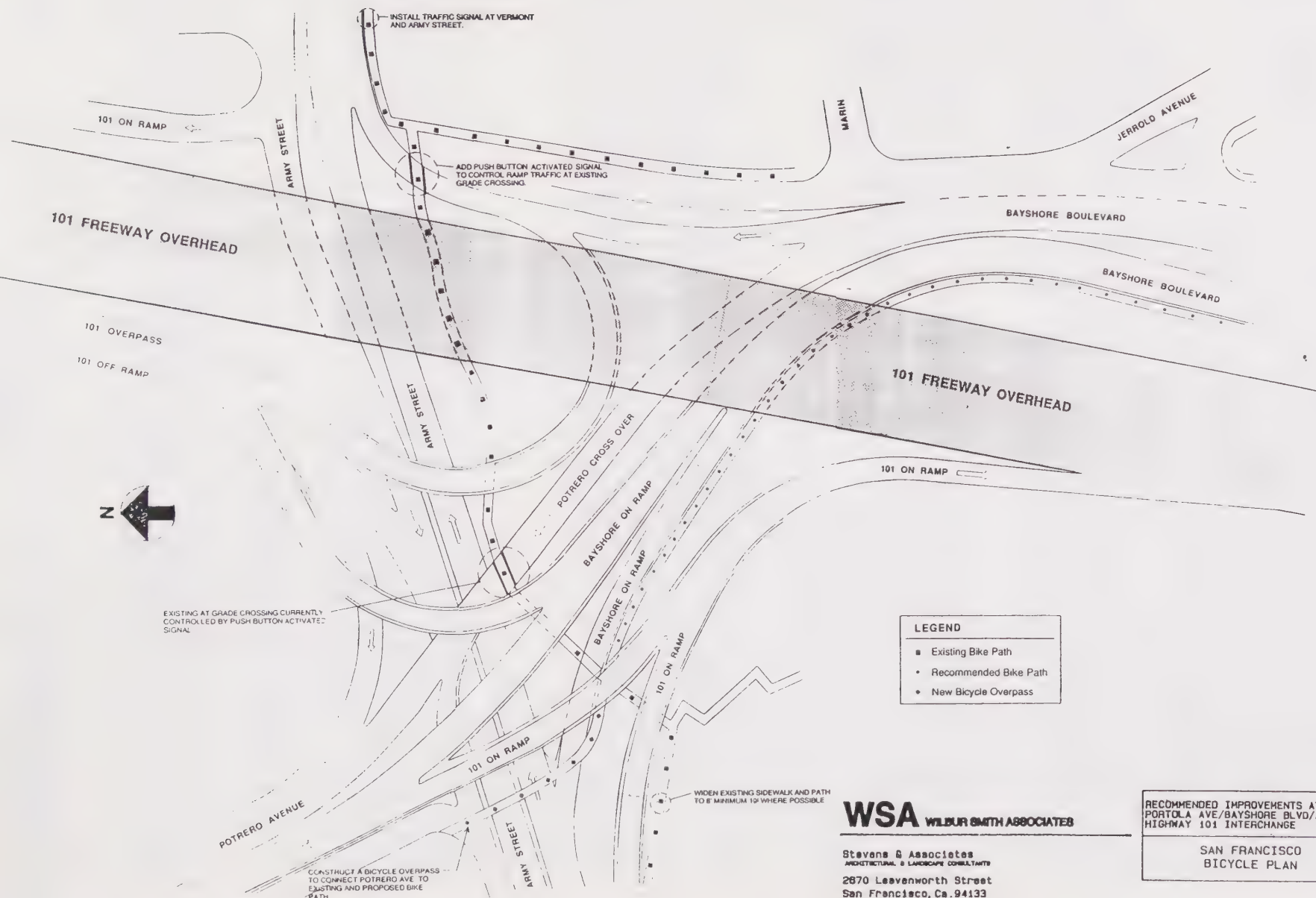
O'Shaughnessy should be restriped to provide bike lanes by narrowing the median from eight feet to four feet. Eight-foot-wide bike lanes are recommended in the downhill direction and 6-foot-wide bike lanes are recommended in the uphill direction. (Bikes should still be allowed to use the side path on O'Shaughnessy Boulevard, but it should not be signed as the bike route). The route continues on Class III to the south on Bosworth Street, which connects to Diamond Street and three other routes: the Valencia Street/Chenery Street route, the Monterey Boulevard bike route or the Cayuga Street bike route. North of O'Shaughnessy, Woodside Road is recommended as a Class III bike route.

Vicente Street

To serve the lower Sunset on the north side of Stern Grove, Vicente Street is recommended as it is flatter than Ulloa Street and has no trolley tracks and less traffic compared to Taraval Street. Traffic calming should be explored to reduce the number of STOP signs. At 14th and 15th Avenues the route connects with the Monterey Boulevard or Portola Drive routes via 14th Avenue and Santa Clara Avenue. 15th Avenue to Ulloa Street to Forest Side Avenue and Taraval Street connects Vicente Street to Dewey Boulevard.

Ocean Avenue/Geneva Avenue

Ocean and Geneva Avenues, between 21st avenue and Bayshore Boulevard, are recommended as they are virtually the only direct way to travel from the Stonestown/Stern Grove Area to the southeast part of the City. Bike lanes are recommended on Geneva Avenue by restriping between Alemany and Mission Streets. Bike lanes on Geneva Avenue can be striped given existing conditions



- LEGEND**
- Existing Bike Path
 - - - Recommended Bike Path
 - • • New Bicycle Overpass

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RECOMMENDED IMPROVEMENTS AT PORTOLA AVE/BAYSHORE BLVD/ARMY ST/ HIGHWAY 101 INTERCHANGE	FIGURE
SAN FRANCISCO BICYCLE PLAN	3-4

south of Mission Street to the County line. A spur route near City College continues east on Ocean Avenue to the Cayuga Avenue route and provides a more direct connection to the northern part of the Cayuga Avenue route. Another short spur, providing direct access to City College from Geneva Avenue, utilizes the existing non-vehicular over-crossing of Ocean Avenue just east of the Ocean Avenue/Geneva Avenue intersection.

Winston Drive

This route is a short connector between the Lake Merced Boulevard route and the Washington Boulevard/San Francisco State route. Although there are several MUNI routes and the traffic can be heavy on the portion of Winston Drive through the Stonestown Mall, this route provides direct access to this major destination. The route runs from Lake Merced Boulevard via Winston Drive and Mercedes Way to Lunado Way. At Lunado Way, the St. Francis Wood and Twin Peaks neighborhoods to the north and the Ingleside District to the south can be accessed via the Washington Boulevard/ San Francisco State route. Winston Drive west of Buckingham Way has sufficient width to stripe bike lanes in both directions, without any change in the number of traffic lanes. Cyclists would benefit by improving the lighting in the Winston Drive tunnel under part of the Stonestown Mall.

Font Boulevard/Holloway Avenue

Holloway Avenue is an important route to connect Balboa BART with SF State. Font Boulevard connects this route to Lake Merced Boulevard. Traffic calming should be explored between Junipero Serra and Harold Avenue.

Cayuga Street/Silver Avenue

This route is recommended as a calmer, lower traffic and thus safer alternative to Alemany Boulevard. Traffic calming may be feasible for the Cayuga Street portion of this route. Southwest of Cayuga Street, Alemany Boulevard, San Jose Boulevard and John Daly Boulevard are recommended to connect to Daly City BART. Goethe Street is recommended to connect cyclists from the Sunset District to Mission Street in Daly City. Sagamore Street and Brotherhood Way are recommended as Class III routes to connect to Beverly Street and Holloway Avenue.

Hunters Point Loop

This route will serve the naval shipyard site. Given its potential for redevelopment, it is extremely important to plan for good bicycle access and to incorporate needed improvements into the required transportation infrastructure.

Oakdale Avenue is recommended between Bayshore Boulevard and Phelps Street, and Palou Avenue is recommended between Phelps Street and Griffith Street. To enter Hunters Point on the northside, Evans Avenue to Innes Avenue is recommended. The specific streets at the easternmost section of this route may vary depending on the land use pattern and street network when this area redevelops. For now, Innes Avenue loops back to connect to Palou Avenue via Lockwood Street, Spear Avenue, and Crisp Avenue.

Great Highway

There are two routes along part of the Great Highway. The road route is well-loved by recreational cyclists due to its location and wide shoulders. It carries high traffic volumes and fast traffic. Sand blown onto the roadway is frequently a problem, causing the road to be closed periodically. Sand build-up is a particular problem on the west side in the area provided for pedestrians (or bicyclists) to wait to cross at the signalized intersections. While experienced cyclists prefer the direct travel and infrequent stops of Great Highway, the highway feel of this route is intimidating to beginning cyclists. The adjacent bike path is slow and narrow, but is suitable for leisurely cyclists whose purpose is primarily to ride near the ocean. The Golden Gate Park Master Plan calls for this path to be extended north to Fulton Street. Destination-oriented cyclists will prefer to use Great Highway.

It is recommended that the Great Highway itself be a designated route. However, many casual cyclists, especially with children, will prefer the adjacent path. Thus, it is also recommended that the adjacent path be widened, and that the crossings of the path with Lincoln and Sloat receive the recommend treatment described in Chapter 5 for a bike path crossing a street.

The route continues to the county line on Skyline Boulevard. Skyline Boulevard is a state highway and bike lanes on this street will require Caltrans approval.

El Camino Del Mar/34th Avenue/Lake Merced Boulevard/John Muir Drive

This route connects the Presidio, Sea Cliff, Lincoln Park, outer Richmond, Golden Gate Park, Sunset, Parkside, and Lake Merced. It begins as a signed route on El Camino Del Mar and 25th Avenue and continues via Legion of Honor Drive. A future Class I spur route through Lincoln Park will follow the former alignment of Camino Del Mar and connect with the route on Clement Street at Seal Rock Drive. Implementation of this spur will require the concurrence of the Golden Gate National Recreation Area and the building of a path through a major landslide area. At Clement Street, it continues on 34th Avenue as a Traffic Calming/Bike Priority street to Cabrillo Street where it turns west to 36th Avenue. From 36th Avenue it is a signed route to the Kennedy Drive route in Golden Gate Park. It continues south through the park via the Polo Field and path to 34th Avenue, where a traffic signal is required at Lincoln Way. 34th Avenue and Clearfield Drive should be designated Bicycle Priority Streets between Lincoln Way and Lake Merced Boulevard. Widening Sunset Boulevard to provide bike lanes would give cyclists more space on the road, but would not attract the casual or novice rider. Bike lanes would be considerably more expensive because the curb would need to be relocated the full length of Sunset Boulevard.

Between Vicente and Wawona Streets, 34th Avenue becomes one-way southbound. (Between Wawona and Yorba Streets, it is proposed to be one-way southbound.) Therefore, the northbound route jogs onto Yorba Street and travels on 35th Avenue to Vicente Street then rejoins 34th Avenue.

The southbound route continues across Sloat Boulevard on Clearfield Drive, Ocean Avenue, the path just west of Sunset Boulevard to either the Lake Merced Boulevard route or bike path. This route in reverse is also the northbound route from eastbound Lake Merced Boulevard or the Lake Merced path. However, from westbound Lake Merced Boulevard the northbound route is from Lake Merced Boulevard via Middlefield Drive, Gellert Drive to Clearfield Drive.

This routing was selected to avoid left turns onto Lake Merced Boulevard, which has very high traffic volumes. There are no traffic signals on Lake Merced Boulevard at either Sunset Boulevard or Clearfield Drive, but there is one where Ocean Avenue crosses Sunset Boulevard. The portion of the route on the Sunset Boulevard path does not cross any streets. An alternative to this path would be to build a short Class I path from the north end of the Lake Merced Boulevard painted crosswalk (west of Sunset Boulevard) to Lake Shore Drive and use Lake Shore Drive instead of the Sunset Boulevard path. The crossing of Lake Merced Boulevard is at a marked and signed crosswalk. Traffic volumes on Lake Merced Boulevard east of Sunset Boulevard are much lower than those west of Sunset Boulevard.

So cyclists can safely travel from 34th Avenue to J.F. Kennedy Drive, a traffic signal is required at Lincoln Way, and the route should use Martin Luther King Jr. Drive and Chain of Lakes Drive. Similarly, to provide a safe connection to Lake Merced Drive a traffic signal is recommended at 34th Avenue and Lake Merced Drive.

Lake Merced Boulevard is important to commuters and utilitarian cyclists. There is an existing City project to provide a parallel 4-foot jogging path around the lake perimeter. Combined with the existing 8-foot asphalt path, a continuous 12-foot minimum width will be available for all users. The City has an existing project to widen Lake Merced Boulevard to have wide curb lanes between Sunset Boulevard and Winston Drive. This section is also recommended as part of the bikeway network.

Lincoln Boulevard/23rd Avenue/Transverse Drive/20th Avenue/ San Francisco State University

Beginning on Lincoln Boulevard in the Presidio, this route serves the middle Richmond District and connects to Golden Gate Park, Stern Grove and SF State. From the Golden Gate Bridge, Merchant Road connects to Lincoln Boulevard taking cyclists to 25th Avenue. A jog on Lake Street connects 25th Avenue with 23rd Avenue, which connects the central Richmond District to Transverse Drive in Golden Gate Park. Bike paths will need to be constructed to connect Transverse Drive at both Lincoln Way and Fulton Street. South of Lincoln Way, 20th Avenue is recommended since 23rd Avenue is not a through street, and 20th Avenue is also preferred to 19th Avenue since it has less traffic but is just as direct. However, 20th Avenue has many two-way STOP signs and must be redesigned using traffic calming techniques. Of course, those bicyclists wishing to travel on 19th Avenue may do so.

To travel past Stern Grove, a new bike path is recommended along the eastern perimeter, jogging around existing trees as necessary. To improve safety and to eliminate any time restrictions, the path or fencing should be relocated such that the path is outside the fencing around Stern Grove. The path should continue on the south side of Stern Grove between 19th Avenue and 21st Avenue. A signal at 21st Avenue and Sloat Boulevard is recommended to enable bikes in both directions to safely cross Sloat Boulevard and continue on 21st Avenue.

From the intersection of 21st Avenue and Eucalyptus Street, an attractive route to SF State University is made impossible by Stonestown Mall and 19th Avenue. It is recommended that bicycle traffic be routed along Ocean Avenue between 21st Avenue and 20th Avenue and then directed into the Stonestown Mall parking lot's access road to Buckingham Way. While this is not ideal, it is

currently used by many SFSU students and is preferred to 19th Avenue due to the fast and heavy traffic on 19th Avenue.

Although many southbound bicyclists ride on the roadway of 19th Avenue as opposed to the sidewalk, northbound bicyclists from SFSU whose destination is west of 19th Avenue tend to ride on the sidewalk on the west side of 19th Avenue. They do not ride on the eastside of 19th Avenue (as a car would) since SFSU is on the west side of 19th Avenue. Riding northbound on 19th Avenue entails crossing busy 19th Avenue twice in order to travel on the right-hand side of the road. Thus, to facilitate and legitimize the current practice, the route continues as a two-way bikepath on the west side of 19th Avenue from Buckingham Way south for about 1,000 feet, as this is the only possible connection to SFSU. For this one block between Buckingham Way and the first fire road to San Francisco State University to the south, a two-way bicycle path should be created using Jersey barriers or some other means of separation to divide the bike path from traffic. Access from Holloway Avenue to this path or SFSU would be via existing SFSU paths. The bike path would need to be two-way to compensate for the inability to turn left on 19th Avenue when exiting SFSU. At Buckingham Way, motorists should be warned of northbound bicycles entering Buckingham Way to proceed westbound. Parking along the west side of 19th Avenue will need to be prohibited for this short section. A conceptual design of this recommendation is depicted in Figure 3-5. Any modifications to 19th Avenue will have to be approved by Caltrans as it is a State highway.

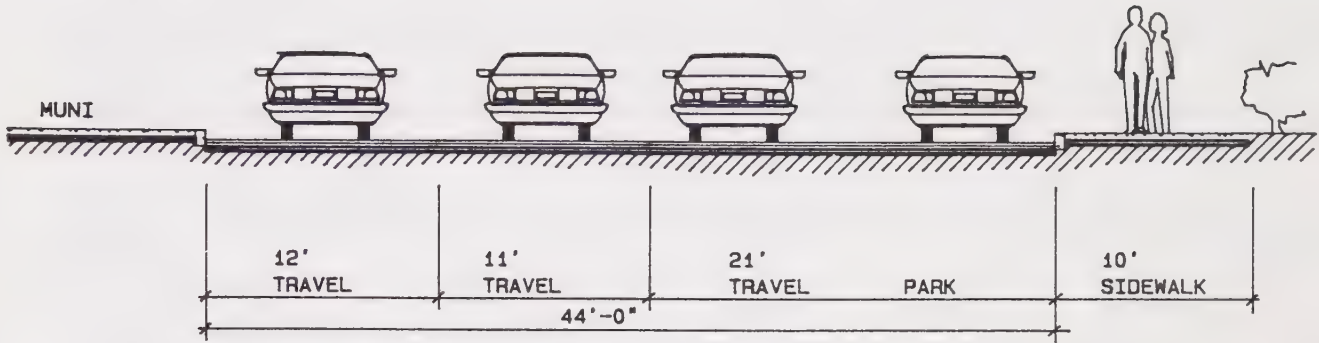
15th Avenue Between the Presidio and Golden Gate Park

This route, connecting the Presidio and Golden Gate Park runs from Washington Boulevard in the Presidio via Battery Caulfield Road, Wedemeyer Street, 15th Avenue, Fulton Street, the existing Golden Gate Park Class I bicycle path, to Kennedy Drive. Fifteenth Avenue, a residential street, is recommended to be a Traffic Calming/Bike Priority street.

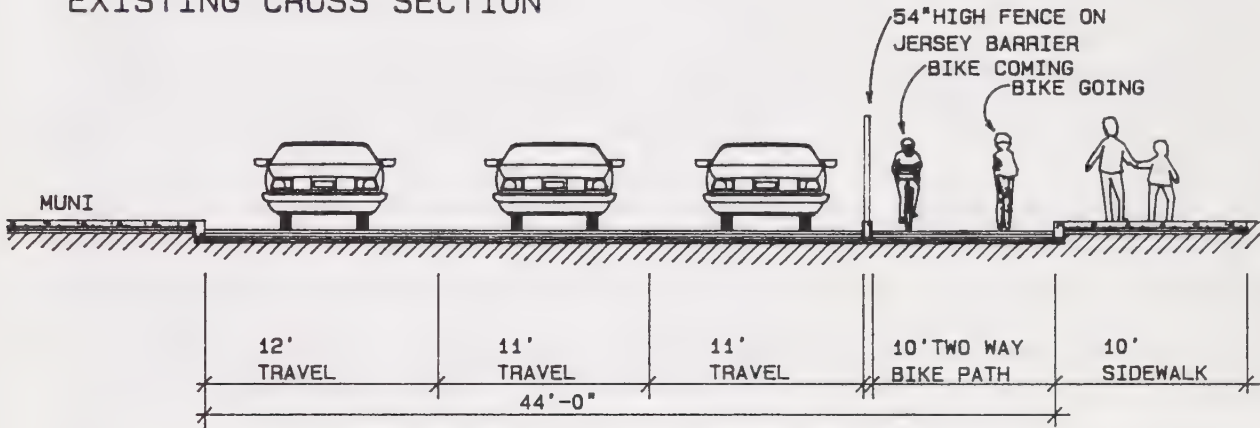
Washington Boulevard/Arguello Boulevard/ 7th Avenue/Laguna Honda Boulevard/Dewey Boulevard/ San Francisco State University

Washington Boulevard in the Presidio and Arguello Boulevard in the Richmond connect the Golden Gate Bridge with Golden Gate Park. Detailed recommendations within the Presidio are beyond the scope of this study, but the most popular northbound route appears to be Arguello Boulevard to Washington Boulevard to Lincoln Boulevard to Merchant Road and then into the tunnel. The Golden Gate Bridge District should consider opening up the entrance to the bike path from the westside approach off Merchant Drive so that bicyclists could avoid the pedestrian traffic around the visitor center.

It is recommended to reduce the number of lanes on Arguello from four to three between Lake Street and Fulton Street in order to stripe bike lanes. The revised lane striping can either be two lanes in one direction and one in the opposite, or one lane in each direction with a left-turn at each intersection. By using Conservatory Drive, it connects with Bowling Green Drive and connects to 7th Avenue via Hugo Street. A spur route from 7th Avenue up Parnassus will take bicyclists to the UCSF Medical Center. 7th Avenue should be designated a bike route. Laguna Honda Boulevard should be restriped to reduce the existing 8-foot painted median to 4 feet and stripe bike lanes.



EXISTING CROSS SECTION



PROPOSED CROSS SECTION



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PROPOSED BIKE PATH
 19TH AVE: BUCKINGHAM WAY TO
 SAN FRANCISCO STATE UNIVERSITY

SAN FRANCISCO
 BICYCLE PLAN

FIGURE

3-5

To access SFSU from the Haight, areas north of the Haight and the inner Richmond, Dewey Boulevard to Claremont Boulevard is recommended from Laguna Honda Boulevard. The route then jogs on Portola Drive to Santa Clara Way, jogs on Monterey Boulevard to San Benito Way, and jogs onto Ocean Avenue to Cedro Avenue to Mercedes Way to Lunado Way to Holloway Avenue. There are two sets of three speed bumps on Cedro Avenue between Ocean Avenue and Mercedes Way and three sets of three speed bumps on Lunado Way between Mercedes Way and Estero Avenue. Speed humps and/or the establishment of Traffic Calming/Bike Priority streets on Cedro Avenue and Lunado Way would be a better alternative to the existing speed bumps. The removal of the STOP sign on Claremont Boulevard at Ulloa Street is recommended.

Presidio Avenue/Masonic Avenue/Downey Street/Ashbury Street/Corbett Avenue

This route connects not only the Presidio with the Panhandle but also serves shopping on Geary Boulevard and other places. While experienced cyclists may divert to Masonic Avenue at Pine Street, the route is recommended to be signed to divert to Masonic Avenue at Geary Boulevard where there is an existing four-way STOP sign that helps bicyclists cross the traffic.

South of the Panhandle, Downey Street for southbound bicyclists and Ashbury Street for northbound bicyclists are recommended to connect to Corbett Avenue. Downey Street is recommended as a Bicycle Priority Street.

Eureka Street/Jersey Street/Sanchez Street

To connect Bernal Heights with Noe Valley with the Haight and the inner Richmond, this route which travels on Sanchez, Jersey, Diamond, 23rd, and Eureka Streets, is recommended. Traffic Calming/Bike Priority street treatments may improve its attractiveness to bicyclists. A short Traffic Calming/Bike Priority spur on Diamond Street connects this route to the route on Clipper Street.

Steiner Street/Sanchez Street

This route provides the least steep ascent from the Marina to Pacific Heights, and it offers connections to four significant east/west routes in the northern part of the city. It begins at Steiner Street and Greenwich Street, travelling south to Golden Gate Avenue. It then travels west to Scott Street to Waller Street, east to Sanchez Street and south on Sanchez Street to meet the route on 17th Street.

Webster Street

Webster Street is recommended from Broadway to Clay. At Clay the route travels west to Steiner and continues on Steiner to Post Street. It travels east on Post to Webster, and then continues south to Hermann Street. This route avoids the steep hills between Sutter and Clay. This route will not only serve to connect upper Market Street with Pacific Heights but will also connect several east-west routes. On Webster Street between Bush and Grove, by restriping to narrow the inside travel lane, 6-foot bike lanes can be provided.

Valencia Street/Tiffany Avenue/Chenery Street/Diamond Street/ (City College)/Monterey Boulevard/14th Avenue

Valencia Street serves the heart of the Mission, has relatively low grades, and connects to the Excelsior and Ingleside districts. It is, therefore, preferable to adjacent parallel streets. Funds have been approved to remove the median on Valencia in order to stripe wider curb lanes. Thus the City has already recognized the importance of this route to bicyclists. However, to improve this facility for bicyclists even more, particularly to casual cyclists, it should be restriped to have three travel lanes and bike lanes in both directions. There are numerous other north-south arterials to accommodate any potential diversion of traffic from Valencia Street: Mission Street, Guerrero Street, Dolores Street, South Van Ness Avenue, etc. The restriping could be to have one northbound lane, one southbound lane and one left-turn lane at each intersection. Alternatively, it could be striped as one northbound and two southbound lanes, or one southbound and two northbound lanes.

To access the southwest part of the City, the less congested streets of Tiffany Avenue, 29th Street, Dolores Street, 30th Street, Chenery Street and Diamond Street are recommended and should be designated Bicycle Priority Streets. From Diamond Street, the route continues onto Monterey Boulevard, from which Circular Avenue splits off two blocks later. To connect Circular Avenue with the west side of town, Hearst Avenue is recommended between Circular Avenue and Genessee Street as a Bicycle Priority Street since it has less traffic than Monterey Boulevard west of Genessee Street. Monterey Boulevard/Santa Clara Avenue is recommended between Genessee Street and St. Francis Boulevard as a Class III route. From St. Francis Boulevard, bicyclists can ride a short distance on Portola Drive and choose among a number of routes, or stay on 14th Avenue and connect with Vicente Street.

To connect to City College, the route diverts from Hearst Avenue to Genessee Street to access the back side of City College.

Polk Street

Polk Street north of Pine Street is the safest and most convenient alternative due to the grades on Larkin and the traffic on Van Ness Avenue and Franklin Street. The Polk Street route connects with the Class I path through Ft. Mason via North Point Street and Van Ness Avenue. Polk Street is a commercial two-way street with one lane in each direction north of Vallejo Street and two southbound lanes and one northbound lane south of Vallejo Street. It is recommended to restripe Polk Street between Golden Gate Avenue and Vallejo Street to have one lane in each direction and 5-foot wide bike lanes. Traffic studies will need to be conducted to determine the impact of removing a southbound lane.

If this recommendation is not adopted, Polk Street is still recommended as the southbound bicycle route due to favorable grades and the existing two travel lanes which enable motorists to more easily pass bicycles. Northbound, however, the one travel lane is narrow. If it is not widened, the recommended northbound route is Larkin Street to Turk Street to Polk Street. This alternative again has bicycles sharing existing narrow lanes, but Larkin Street has multiple lanes as opposed to northbound Polk Street so that motorists can more easily pass bicycles. This Polk Street/Larkin Street couplet alternative is considered inferior to providing bike lanes on Polk Street. It does

nothing to improve bicycling safety other than providing routing information and signing and would not appeal to casual cyclists.

To access Market Street at Civic Center, because Polk Street is one way at this end, the route travels south on Polk to Market, but its northbound access is from Market and Larkin, travelling north to Turk and then connecting to Polk Street.

Howard Street/Folsom Street and Harrison Street

This one-way couplet is recommended to link with Harrison Street as a major route from the CBD into the Mission. While normally, continuity would dictate choosing Harrison Street all the way from the Mission to the Embarcadero, Howard Street/Folsom Street were deemed better due to fewer conflicts with freeway ramps than Harrison Street, and their close proximity to employment centers in the South of Market (SOMA) area. It is recommended that Howard Street be restriped to lose one travel lane and add a westbound 6-foot bike lane. Folsom Street currently has 23-foot wide curb lanes, thus a 6-foot eastbound bike lane is recommended from The Embarcadero to 11th Street and can be striped given the existing curb lane width. There is a connector at 11th Street Along Division to Townsend.

11th Street between Folsom Street and Harrison Street has two 30-foot travel lanes and should be restriped to include an 8-foot bicycle lane in both directions. Between Folsom Street and Market Street, 11th Street should be restriped from two southbound lanes and one northbound lane to one lane in either direction and bike lanes should be striped. Finally, it is also recommended to restripe Harrison Street and install 6-foot bike lanes between 11th and Army Streets. A travel lane would need to be eliminated between 16th and 22nd Streets.

Townsend Street/Kansas Street/Potrero Avenue/Bayshore Boulevard/ (San Francisco International Airport)

Townsend Street is an extremely important route since it serves the CalTrain Depot. The recommendations for Townsend Street are to stripe bike lanes between Third Street and Division Street. The two-lane section of Townsend between 4th and Division Streets has adequate width for bike lanes. The number of lanes on Townsend between 4th and 5th Streets would need to be reduced in order to stripe bike lanes on this block.

Kansas Street and 17th Street connect Townsend Street to Potrero Avenue. Potrero Avenue/Bayshore are important to serve the industrial districts as well as Bayview, Hunters Point and Candlestick Park. The Army Street/101 interchange at Potrero Avenue/Bayshore Boulevard is a major challenge for even serious riders. To remain on Potrero Avenue southbound or Bayshore Boulevard northbound requires weaving across lanes of fast moving traffic onto raised ramps, overcrossings and off-ramps. A conceptual plan for accommodating northbound and southbound cyclists through this interchange and making vehicular traffic aware of bicycles is presented in Figure 3-4. The recommendations include directing cyclists to Kansas Street east of 101 via 23rd Street, and installing a traffic signal at Vermont Street/Army Street to cross Army Street and access the existing bike path on the south side of Army Street. A new path should be constructed to connect the existing bike path on the south side of Army Street with Bayshore Boulevard to the south along the edge of the ramp. A long-term recommendation is to create a bike overcrossing over Army Street (which is depressed at this point) from the intersection of Potrero Avenue/25th Street to

connect to this same existing path. This would eliminate the need for bikes to use the circuitous 23rd Street/Kansas Street/Vermont Street route.

Columbus Avenue/Sansome Street/Battery Street/Second Street

This route connects the Aquatic Park and Fisherman's Wharf Areas with North Beach, the Financial District, and the South of Market Area. It connects with the Northpoint Street/Marina Boulevard/Old Mason Street route at Columbus Avenue. Although Columbus Avenue has narrow lanes and high traffic volumes, there is no other reasonable alternative that is as direct and flat. The Washington and Clay Street couplet connects Columbus Avenue with the Sansome and Battery Street couplet to the Market Street route. Sansome and Battery Streets have wider curb lanes than Kearny and Montgomery Streets and either lower or comparable traffic volumes. The route continues south of Market Street via Second Street to King Street. It is recommended that one traffic lane be removed on Second Street so that bike lanes can be stripped in both directions.

Stockton Street

To serve Chinatown, the Union Square shopping district and the financial district, Stockton Street is recommended between Broadway and Market Street. It has heavy traffic, as do parallel routes, but the tunnel provides access through Nob Hill not available on parallel routes. Lastly, Stockton Street is centrally located between The Embarcadero and Polk Street. Thus, Stockton Street is recommended as the best alternative to fill what would otherwise be a gap in the bikeway network.

The Embarcadero/Third Street Corridor/Candlestick

The Embarcadero is one of the most important routes in the City—both for commuter and recreational cyclists. The Embarcadero carries a large volume of fast moving traffic. Storm drains, a high curb, and the surface of the bike lane stripe all subtract from the physical width of the existing bike lane, yielding a lower effective width. The scenic views of the waterfront are likely to attract a large number of bicyclists, resulting in demand for a wider bike lane. A minimum 6-foot bike lane is recommended for the full length of The Embarcadero. It is also recommended that casual, slower cyclists be allowed to use the promenade.

The recently completed South Embarcadero project includes bike lanes that were added after the cross-section was already designed. It was designed to have an 11-foot inside lane and 15-foot curb lanes on sections with no on-street parking, and 23-foot wide curb lanes on sections with on-street parking, and was to be signed as a bike route, not as bike lanes. To fit in bike lanes, the minimum bike lane width of 4 feet with no on-street parking and 5 feet with on-street parking was striped. The resulting roadway has bike lanes which meet Caltrans minimum design standards plus or minus a few inches. This is also the design that is currently being implemented in the construction of the North Embarcadero project. The difficulty in providing wider bike lanes was compounded by the method of surveying which resulted in 6 fewer inches of roadway width for each direction of travel. This survey method resulted in the inside lane only being 10' 6" instead of 11 feet.

Six-foot wide bike lanes are recommended as stated previously. 6-foot wide bike lanes can be provided on The Embarcadero south of Folsom Street where there is parking by restriping the existing new roadway to have a 10-foot lane adjacent to the bike lane. Where there is no on-street parking, 5-foot wide bike lanes can be provided by restriping—again to have a 10-foot lane next to

the bike lane. While not ideal, it is better to have the extra foot in the bike lane where bicycles can use it to their advantage such as avoiding opening car doors. Repouring the curb and gutter to provide an extra one to two feet of roadway space for each direction of travel would be the best alternative to improve safety for both motorists and bicyclists, as 11-foot lanes could then be maintained adjacent to the 6-foot bike lanes.

The North Embarcadero project between Broadway and North Point Street, has been constructed but not striped. The bike lanes should be striped as recommended for the South Embarcadero portion; 5-foot wide bike lanes where there is no on-street parking, and 6-foot wide bike lanes where there is on-street parking.

The Mid-Embarcadero section between Folsom Street and Broadway is currently in the planning stages. A preferred alternative is to be selected in summer or fall of 1995. Some of the alternatives for this section include tow-away lanes during peak hours. This would preclude the striping of the bike lanes for this portion of The Embarcadero, although the same roadway width would be provided. This is not recommended. The Embarcadero is a very popular, highly visible bike route, and bicyclists and motorists could be confused by the abrupt termination of bike lanes. If tow-away lanes are adopted, the following should be implemented.

- ▶ Minimum 11-foot lane adjacent to curb lane;
- ▶ Minimum curb lane width of 15 feet during peak hours; and
- ▶ Pavement stencil indicating bike route exists even during peak hours.

In addition to bike lanes, it is recommended that two adjacent but separate paths be provided as illustrated in Figure 5-5 of Chapter 5. One would be for bikes or roller bladers travelling in excess of 10 mph, and one for pedestrians and slower cyclists travelling at around 5 mph. This arrangement would enable southbound bicyclists to enjoy non-stop travel along the waterfront which is not possible if they ride on the street. Such a facility would truly be a regional attraction, taking advantage of the proximity of BART, several ferry services and the connection to the Golden Gate Bridge. It would be a shame if the waterfront were not developed to its full potential for all users.

For cyclists wishing to travel southbound along the Third Street corridor, King Street connects The Embarcadero with Third Street. Improvements will be needed to the Third Street bridge crossing of the China Basin channel. Bike lanes are recommended along Third Street from King Street to Mariposa Street. From Mariposa Street, the route continues as a Class III facility on Indiana Street where bicyclists continue south to 23rd Street. From 23rd Street, Indiana Street is still recommended but the existing one-way section would need to be redesigned to accommodate southbound bicyclists. At Islais Creek a bicycle/pedestrian bridge crossing is recommended. Given the redevelopment potential for Hunter's Point, this route and bridge crossing could be a critical link in providing alternative access to the area. Once across Islais Creek, Rankin Street is recommended to connect to Evans Avenue, and subsequently to Phelps Street.

From Phelps Street, Candlestick Park can be accessed by using Palou Avenue, south on Keith Street, east on Carrol Avenue, south on Ingalls Street, and east again on Gilman Avenue. This should be designated a bike route.

Third Street

The entire length of Third Street is recommended as an essential, direct link for cyclists travelling through the eastern side of the City. From China Basin to Bayshore Boulevard, 6-foot wide marked bike lanes are recommended to make this route safer for cyclists. However, the possible establishment of a light rail line on Third Street could compete with the bike lanes for street width.

Golden Gate Park

All bicycle routes and paths recommended in the Golden Gate Park Master Plan are shown on the map. These include routes for bicycle circulation within the park as well as spurs to connect the park with citywide bicycle routes and local streets. Both the Golden Gate Park Master Plan and the Comprehensive Bicycle Plan have been revised so that the bicycle routes in and surrounding Golden Gate Park are consistent in both plans.

RECREATIONAL ELEMENT

Introduction

San Francisco has been widely acclaimed as being one of the world's most beautiful cities with its picturesque, magnificent natural and urban setting. The recreational element attempts to enhance public access and enjoyment of this setting through the use of the City's recreational bikeways and facilities.

Recreational cycling is often a prelude to bicycle commuting. The more people who become interested in bicycling for fun and fitness, the more potential bicycle commuters there will be. Thus, efforts to promote recreational bicycling can be construed as efforts to promote bicycle commuting and its inherent environmental benefits such as reduced energy consumption, reduced hydrocarbon emissions, etc. People of all ages and all athletic abilities can enjoy bicycling, since it is a low impact aerobic activity. Although most of this report focuses on the bicycle as a transportation mode, we must not forget that bicycling is also just plain fun. The recreational element will make specific suggestions for routes and places to ride to address the recreational needs of all San Franciscans.

As discussed previously, the overall bikeway network can be used for utilitarian or recreational purposes. Improvements to bike routes that may primarily, but not exclusively, serve recreational bicyclists were addressed in the bikeway network recommendations. The focus of the recreational element, therefore, is not on routes per se, but on the following four areas:

- ▶ Family-oriented loops or routes
- ▶ Children's learning area
- ▶ Scenic bicycle route
- ▶ Mountain biking

Guidelines for Recreational Element

The following guidelines were used in developing the recreational routes:

- **Utilize Planned Network Where Possible** - The recreational element is part of the larger bikeway system. Combine, where appropriate, with other bicycle elements to maximize cost efficiency, implementation access and maintenance.
- **Public Access** - Identify and provide different recreational bicycling facilities for all parts of the City.
- **Regional Recreation Facility Improvements** - Expand and improve existing trails in established regional recreational areas.

Recreation Element - Recommendations

Youth and Family - Learning facilities for young children and the beginning rider are proposed at various locations throughout the City. Trails for group cyclists such as families who want to ride together are also identified.

Learning facilities are recommended in Golden Gate Park, Lake Merced Park, McLaren Park, Candlestick Shoreline Park (on days when there are no games), the Presidio (one site off Lincoln Boulevard and a second on Crissy Field) and Mission Bay (at China Basin). Access to these areas is recommended by utilizing proposed bikeway routes. Locations of recreation facilities are shown on the attached oversized Map 2.

Golden Gate Park - The Draft Golden Gate Park Master Plan recommends closing John F. Kennedy Drive during specific hours on Sundays and some holidays. The park is a regional attraction, and such action would significantly improve its attractiveness to family and general recreation riders. A learning facility is planned as a loop road in the interior of the park. This plan supports both recommendations.

Lake Merced - Widening the existing bike path is recommended for this regional park. Presently it is not ideal for adult bicycling, as the path is shared by runners and walkers. The existing path is 7 to 11 feet width. Where possible, such as adjacent to John Muir Drive, two separate paths are recommended so that small children and senior citizens can have their own facility. In other locations, the path should be widened to be between 12 and 16 feet in width. It may be necessary to remove parking between Winston Drive and SF State University to implement this.

City College, Candlestick Park - Youth and family biking is envisioned for both areas during non-activity periods. Shared use of existing facilities for recreation/parking, etc. should in the future become more commonplace at other public and institutional land uses.

Balboa Park, McLaren Park - It is recommended that the flat areas of these hilly parks be used for youth and family use. At McLaren, the top and perimeter are flat. Portions of loop road should be closed for bike learning area for small children.

Mission Bay, Embarcadero - A bike trail loop is proposed at the perimeter of Mission Bay as part of the Mission Bay Plan. A bike trail is proposed along the northeast waterfront along the Embarcadero as part of the Embarcadero Waterfront Urban Design Plan.

Lower Potrero Hill - Recreation bike routes are recommended along lower, flatter areas at the north edge of the district which connect Embarcadero to Mission and Bernal Heights.

Presidio - Lincoln Boulevard/Crissy Field - The Presidio Master Plan recommends a bicycle route on Lincoln and Washington Boulevards. In addition, it is recommended that Crissy Field be used as a bike learning facility for small children.

Scenic Bike Loop - An important component of the overall recreational element is the proposed scenic bike loop. The loop would have three purposes:

1. To encourage local bicyclists to do more recreational riding in the City.
2. To promote San Francisco as a destination for tourists interested in bicycling and to relieve traffic congestion and parking problems at tourist destinations.
3. To encourage tourists to venture beyond the traditional sightseeing spots of San Francisco.

A side benefit of a successful scenic loop would be a reduction in vehicle exhaust and traffic congestion at the more popular tourist destinations such as Fisherman's Wharf, Telegraph Hill, Golden Gate Park and Marina boulevard.

The idea behind the scenic bike loop is similar to the existing 49 mile scenic auto loop. It would be signed as a special bike route and could be promoted by the San Francisco Convention and Visitors Bureau (SFCVB) and possibly by retail bicycle shops in the City. Funding could come from the SFCVB and the advertising of bicycle shops and bike equipment on a map. It could also be combined with a map that shows recommended walking tours and could be sold in stores.

The proposed scenic loop will be attractive to tourists as well as City residents. It has several subroutes and spurs to visit points of scenic or historical interest. It is envisioned that the route will be designed as a self-guided tour, so riders can choose the length of the route that suits their time frame and physical ability.

The attached Map 3 shows the proposed loop. It is certain that the exact alignment of the route will change as the route is developed with input from the bicycling community and the CVB. When the exact route is finalized and implemented, the usefulness and success of the route will be extremely dependent on how well the route is signed.

The northern route concentrates on the Embarcadero, the Presidio and Golden Gate Park. For the more ambitious, an additional loop goes through the more southern neighborhoods, and visits Lake Merced, Mission Dolores and the Latino Cultural area along 24th Street. The route is chosen to maximize scenic potential, allow bicyclists to see as much of the City as possible, minimize conflicts with other vehicles, and to be as flat as possible. The latter, of course, limits the number of scenic high-elevation view points, so an attempt to balance both aspects was made.

It is recommended that, regardless of who publishes the map, it indicate:

- ▶ Points of interest (museums, historic sites, restaurants, etc.)
- ▶ Scenic overlooks
- ▶ Grades of greater than 5 percent
- ▶ Bike repair shops
- ▶ Neighborhoods
- ▶ Bicycle parking facilities
- ▶ Bicycle Rental Facilities

Bicycle Rental Facilities - Bicycles should be available to rent for all residents and visitors of the city at convenient locations near the bicycle network. Around Golden Gate Park five stores offer bicycle rentals, due to the scenic beauty and relatively safe riding conditions of that area. As other areas of the city become safer for bicycle riding, bicycle rental facilities will follow. The city should encourage the location of these facilities to be near areas with high concentration of visitors such as Piers 33 and 35 where many cruise ships dock, Pier 41 and 43-1/2 where many excursion boats and ferries from Sausalito and Tiburon depart, and at The Ferry Building at the foot of Market St. In addition, select BART stations such as Glen Park, Civic Center, and Embarcadero (although this could be combined with the Ferry Building facility) are recommended.

Mountain Biking - The increasing popularity of mountain bikes has required many cities and parks to recognize and regulate their use in natural areas. In general, mountain biking does not impact trails any more than use by equestrians or hikers. However, some mountain bicyclists, like some hikers, choose to leave designated trails, which can cause erosion problems and damage to the vegetation. There also have been some problems with mountain bikes sharing trails with equestrians and hikers, especially on narrow trails.

Multi-use off-road trails have been successfully implemented in many other parks. Hiker, equestrian, and bicyclist conflicts are less likely to occur on trails when all users know that the trail is designated for multiple uses. Any additional maintenance costs that are perceived to arise from bicycle use could be paid for by the City and/or mountain biking organizations. Additionally, restriction of bicyclists to paved surfaces only is likely to meet strong opposition from the increasingly organized mountain biking community.

Given the limited amount of natural areas within the City, it is important that off-trail riding and hiking be controlled and resources protected. However, in order to serve the large, and growing, number of mountain bicyclists in the City, multi-use trails need to be designated to discourage off-trail riding. While detailed recommendations regarding the expansion of mountain bike facilities are beyond the scope of this study, a suggestion regarding potential opportunities to expand or improve off-road biking is to use some of the many dirt roads throughout Golden Gate Park and the old railroad grade along the top of the bluffs in Lincoln Park. Many bicyclists already use these dirt roads, but with designation as a multi-use trail, their use could be recognized and regulated.

Recommendations for Future Planning Efforts

In new developments and re-development areas—such as Mission Bay, Embarcadero, etc.—a dedicated bicycle recreational element should be required as part of their circulation/open space plan. These elements should also indicate connections with the total bikeway system.

It is recommended that the City work with the Port and the National Park Service to develop a waterfront bike path the full length of the waterfront from Hunters Point to the Golden Gate Bridge and along the ocean front to Fort Funston.

RECOMMENDED SIGN PROGRAM

A bicycle route signage program is critical to the successful implementation of the City's bicycle route network. Bicycle route signs, like highway signs, must be consistent throughout the system and easily recognizable to the bicyclist and motorist alike. Using a unique logo or other identifying symbol or to distinguish the bicycle route signs from highway signs is useful. At a minimum, the bicycle route signs should include the identifying logo, the route number (if a numbering system is being used) and the direction of travel. Signs for regional routes that coincide with City routes should accompany the City signage along the route segments that are shared.

The route designation programs in Denver, CO and Dallas, TX were reviewed in the process of developing a program for San Francisco. Both cities have adopted a route numbering system, a distinctive system logo and customized sign designs. The following program for San Francisco includes recommendations for route numbering, sign design, and sign placement.

Route Numbering System - The numbering systems adopted in Dallas and Denver are patterned after the established federal highway numbering system, using a system of odd number routes running north-south and even number routes running east-west. The proposed numbering program for San Francisco also uses the even-odd differentiation. Route numbers will be assigned in ascending order from one compass point to the other, i.e. from north to south and from west to east. Numbers will be skipped in the labelling process to allow for routes added in the future. It also might be appropriate to consider the use of an additional designation to identify special-use routes such as scenic or regional routes.

Sign Design - The bicycle route system signs should include, at a minimum, the identifying system logo, route number and a directional arrow. Incorporating the route destination, distance to destination, route endpoints, compass direction and identification of crossing bicycle routes into the sign design would be more useful to the route users. The City of Denver has adopted a "bike-way-finding" sign design which includes the system logo, route number, route endpoints, and a schematic route map showing major cross streets, crossing bicycle routes, and a "you-are-here" sticker.

Variations of possible sign designs are included in Figure 3-6. Signs "A" and "B" are simple route markers including the system logo, route number and direction of travel. As shown in these samples, destination or distance placards can be added to make the sign more informative. To keep costs down, routes numbers can be applied to the appropriate signs with self-adhesive stickers. Signs "C" and "D" are much more detailed, more informative and, unfortunately, more expensive to produce. However, they could be considered cost-effective to use along high volume routes or routes with

many turns. Route intersection information is very important to the bicycle network users and, at minimum, should be provided on a placard attached to the basic route map, as illustrated with Sign "E".

Because of the costs associated with manufacturing the bicycle route signs, the City of Dallas uses small self-adhesive route markers placed on poles along the route. This route marker, Sign "F" in Figure 3-6, can be used between other bike route signs and whenever the route does not change direction. Stickers, like that shown by Sign "G", could also be used to identify bicycle route crossings on roads not part of the route network.

Special purpose bike route signs are designed to accommodate the needs of a specific bicycling group. A sample scenic bike loop sign is presented in Figure 3-7. This sign is aimed at the out-of-town recreational bicyclist and provides a great deal of information about sights, services and transit connections available along the route. Segment distances and bicycle parking facilities should also be included. Production and installation costs could be offset by charging bike shops or restaurants to have their names placed on the sign.

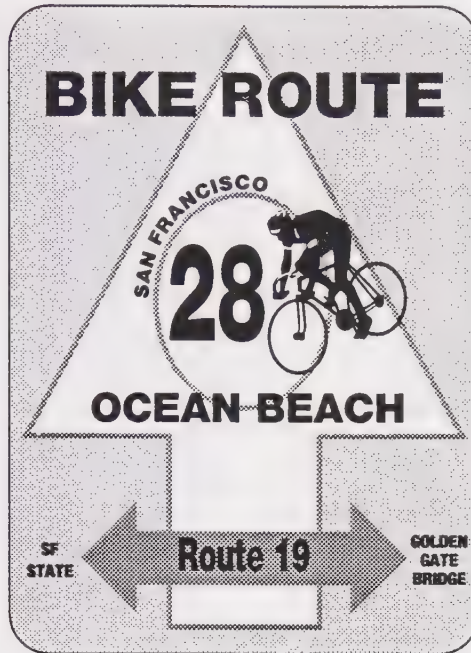
Sign Placement - Bicycle route system signs should be placed at intervals frequent enough to make it easy to follow the route. The Basic Route Sign should be placed at major intersections, whenever the route changes direction, and at intersections with other bicycle routes. The bicycle route stickers can be used between intersections and/or between route signs. Because installation of these specialty signs can be costly, they should be placed in conjunction with other signage where ever possible.

The Schematic Route Map Sign "D" would be most effective on routes that have many crossings and intersections such as in the West Portal and Glen Park districts. Because of the curvilinear road network in these areas, it is difficult to determine where certain routes will go. Small maps of the area with routes and destinations such as depicted in "D" would be informative. Another location suggested for these more detailed signs is adjacent to projected high bicycle traffic generators, such as San Francisco State University. Recreational area maps of the Presidio and Golden Gate Park showing the locations of points of interest, parking, and restrooms would be useful for users of these parks.

The detailed Scenic Bike Loop sign, shown in Figure 3-7, should be placed at 2-3 mile intervals along the loop, and at all turns or changes in direction. The Basic Route Sign should be placed at major intersections, whenever the route changes direction, and at intersections with other bicycle routes. Care should be taken when placing the signage for this loop, since it will likely be used by many bicyclists unfamiliar with San Francisco.



A. SINGLE-ROUTE SIGN WITH DESTINATION



C. ROUTE INTERSECTION SIGN



E. SINGLE-ROUTE SIGN WITH ROUTE CROSSING



B. SINGLE-ROUTE SIGN WITH DISTANCE



D. SCHEMATIC ROUTE MAP SIGN



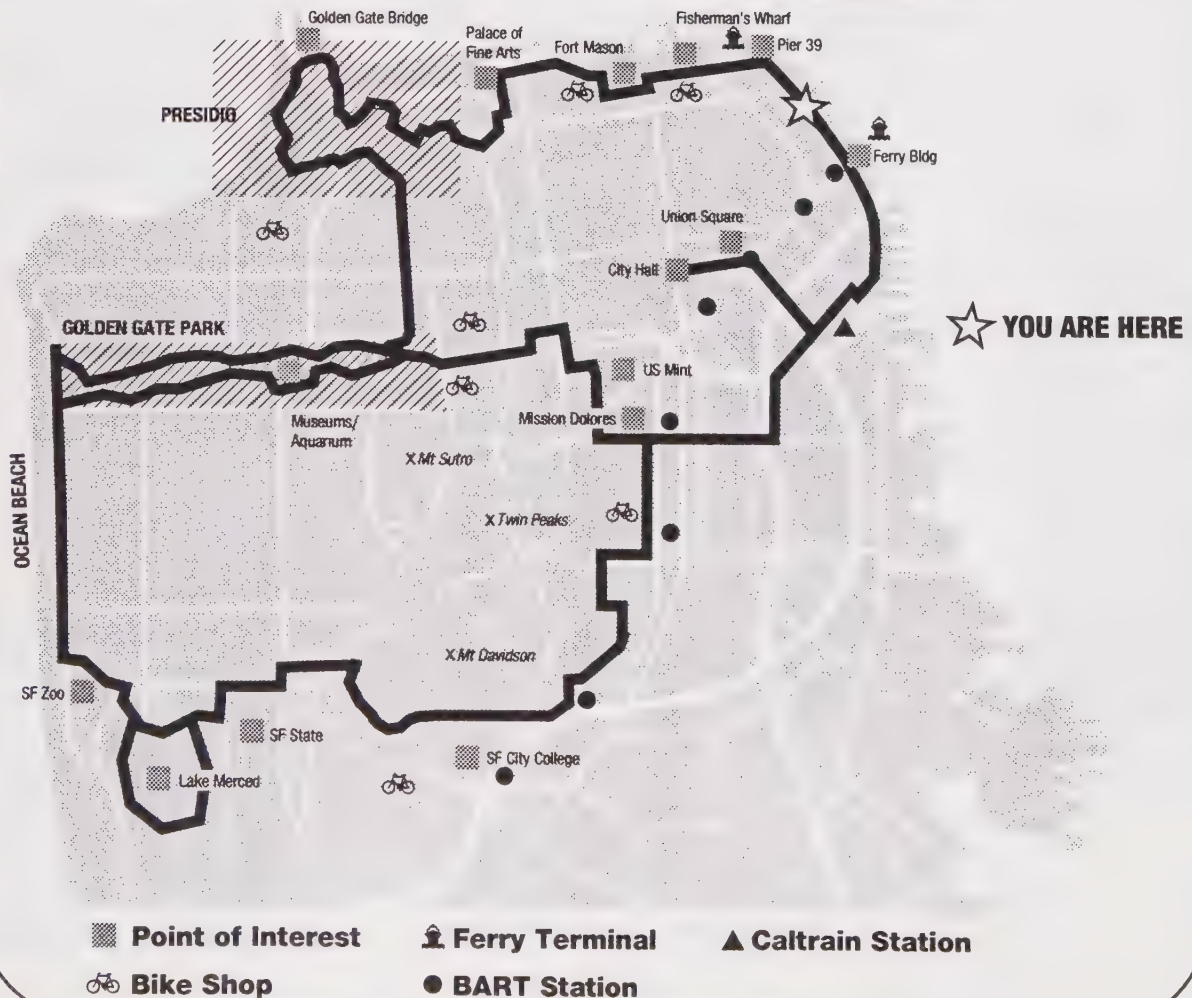
F. SMALL SELF-ADHESIVE ROUTE MARKER



G. SMALL SELF-ADHESIVE ROUTE CROSSING MARKER

City of San Francisco

SCENIC BIKE LOOP





DESCRIPTION OF RECOMMENDED IMPROVEMENTS AND COST ESTIMATES

SAN FRANCISCO BICYCLE PLAN

WILBUR SMITH ASSOCIATES

STREET	FROM	TO	STREET WIDTH	TYPE	NEEDED IMPROVEMENTS	LENGTH (miles)	ESTIMATED COST /1/	
Northpoint	Embarcadero	Columbus		III	Install signing and pavement legends	1	\$3,400	
Columbus	Northpoint	Beach		III	Install signing and pavement legends		inc	
Beach	Columbus	Polk		III	Install signing and pavement legends		inc	
Ft. Mason	Polk	Marina		I	Install signing and pavement legends on existing path	0.75	\$2,400	
Marina	Laguna	Baker		II	Stripe on-street bike lane	1.1	\$10,000	
Marina	Ft Mason/Laguna	Buchanan		I	Widen bike path adjacent to road	1.3	\$220,000	
	Buchanan	Scott		I	Stripe to separate bike path from ped path		inc	
	Scott	Old Mason		I	Widen existing path for bikes and peds		inc	
Old Mason	Marina	Lincoln Ave		II	Stripe 7' bike lanes on Old Mason Rd.	1.75	\$33,000	
					Widen end of Old Mason and allow bike access to Lincoln		inc	
Lincoln	Old Mason	G.G. Bridge		I, II	Stripe 6' bike lanes along Lincoln to bridge path entrance		inc	
				I	Widen/improve existing access path for bridge	0.2	\$63,000	*
Francisco	Lyon St	Cervantes Blvd		BPS	Modify STOP signs to eliminate 2 & 4 -way inconsistency	1.3	\$1,500	
Cervantes Blvd	Francisco St	Bay St		BPS	Modify STOP signs, traffic calm if necessary		inc	
Bay St	Cervantes Blvd	Laguna St		II	Retain bike lanes		inc	
Laguna St	Bay St	Francisco		BPS	Modify STOP signs, traffic calm if necessary		inc	
Francisco St	Laguna St	Polk St		BPS	Modify STOP signs to eliminate 2 & 4 -way inconsistency		inc	
Greenwich	Lyon St	Polk St		BPS	Modify STOP signs, traffic calm if necessary	1.1	\$1,300	
Broadway	Embarcadero	Webster St		III	Install signing and pavement legends	2.1	\$7,100	
					Implement improvements in tunnel as described in text		\$179,000	*
Pacific St	Mason St	Polk St		BPS	Modify STOP signs, traffic calm if necessary	0.5	inc	
Clay St	Webster St	Cherry		BPS	Modify STOP signs, traffic calm if necessary	1.6	\$1,800	
Sacramento St.	Cherry St	Arguello St		BPS	Modify STOP signs, traffic calm if necessary	0.3	inc	
Cherry	Sacramento	Jackson		BPS	Modify STOP signs, traffic calm if necessary	0.2	inc	
Lake St	Argeullo St	3rd Ave		III	Bike route to connect Clay St & existing bike lanes	0.2	inc	
	3rd Ave	12th Ave		II	Bike lane exists	0.4	inc	
	12th Ave	14th Ave		II	Stripe bike lanes next to right-turn lane	0.1	inc	
	14th Ave	25th Ave		II	Restripe faded bike lane lines	0.55	\$10,000	
	25th Ave	28th Ave		II	Stripe bike lanes	0.15	\$2,700	
	28th Ave	30th Ave		III	Install signing and pavement legends	0.1	inc	
Sutter /Post	Market St	Gough St		III	Change signage to indicate bike and bus share lane	1.4	\$4,700	
Sutter /Post	Gough St	Presidio		III	Install signing and pavement legends	1.3	\$4,400	
5th St	Market St	Townsend	52'6"	II	Re-stripe 5th St. by removing one southbound travel lane and striping bike lanes in both directions.	0.8	\$62,000	
							inc	
Turk St	Market St	Arguello	44'9"	II	Re-stripe to remove one vehicle lane, add 6' bike lane, and	2.85	\$61,000	
Golden Gate	Market St	Lyon St	48'9"	II	widen sidewalk (cost for sidewalk widening not included)	2	\$43,000	
Lyon St	Golden Gate	Turk St		II	Stripe northbound bike lane	0.05	inc	
Cabrillo	Arguello	Great Hwy		BPS	Modify STOP signs, traffic calm if necessary	2.9	\$3,300	



Table 3-1

DESCRIPTION OF RECOMMENDED IMPROVEMENTS AND COST ESTIMATES

SAN FRANCISCO BICYCLE PLAN

WILBUR SMITH ASSOCIATES

Market	Embarcadero	Duboce		III	Install bicycle traffic signal heads from Emb to Van Ness	2.6	\$517,000	
	Duboce	Castro		II	Retain existing bike lanes, install signs and pavement legends	0.3	inc	
Corbett St	17th St	Clayton St		III	Install signing and pavement legends	1.6	\$5,400	
17th St	Eureka St	Portola St		III	Install signing and pavement legends		inc	
17th St	Castro	Eureka St		III	Install signing and pavement legends westbound		inc	
Market St	Eureka	Castro		III	Install signing and pavement legends eastbound		inc	
Duboce	Market St	Church St		BPS	Two way bikes only Market St to Church St	0.08	inc	
Wiggle	Steiner St	Scott		BPS	Modify STOP signs, traffic calm if necessary	0.5	inc	
Oak St	Scott St	Baker St		II	Construct 2-way bike path along Oak St by removing parking on north	0.22	\$383,000	*
							inc	
				I	Extend bike path in Panhandle to connect to Oak St.	0.02	\$4,800	*
Panhandle	Baker St	Stanyan St		I	Widen bicycle path, modify signals at Fell and Stanyan	0.75	\$95,000	*
JFK Drive	Stanyan St	Great Hwy		BPS	Traffic calm to slow traffic	3.75	\$4,300	
Kirkham St	Lower Great Hwy	Great Hwy		I	Build bicycle path to connect to Great Highway	0.05	\$12,000	
Kirkham St	Lower Great Hwy	7th Ave		BPS	Modify STOP signs, traffic calm if necessary	2.6	\$3,000	
Hugo St	7th Ave	3rd Ave		BPS	Modify STOP signs, traffic calm if necessary	0.25	inc	
Kezar Path	JFK Drive	Lincoln Blvd		I	Build bicycle path on east side of Kezar, signal at Lincoln	0.5	\$314,000	*
Page St	Stanyan St	Market St		BPS	Modify STOP signs, traffic calm if necessary	2	\$2,300	
16th St	3rd St	Kansas St		II	Stripe bike lanes in both directions	0.8	\$15,000	
17th St	Market St	Kansas St		BPS	Modify STOP signs, traffic calm if necessary	1.8	\$2,100	
Army St	Indiana St	Potrero		III	Install signing and pavement legends	0.8	\$2,700	
Army St	Potrero St	Guerrero	80'	WC	Re-stripe to allocate 2' to each curb lane from 4' median	0.9	\$1,047,000	*
Army St	Guerrero	Sanchez		III	Install signing and pavement legends	0.4	\$1,400	
Clipper St	Sanchez St	Portola		III	Install signing and pavement legends	1	\$3,400	
Portola Dr	Corbett St	Laguna Honda		III	Install signing and pavement legends	0.9	\$3,000	
Portola Dr	Laguna Honda	Evelyn St	68'	WC	Re-stripe inner lanes from 12' to 10' and	1.2	\$38,000	
					curb lanes from 20' to 22'		inc	
Rafael Way	St. Francis	Portola		III	Install signing and pavement legends eastbound	0.1	inc	
Sloat Blvd	Portola	Great Hwy		III	Install signing and pavement legends	2.1	\$7,100	
Woodside	Laguna Honda	Portola		III	Install signing and pavement legends	0.5	\$1,700	
O'Shaughnessy	Portola	Bosworth	40'	II	Re-stripe to narrow median to 4' for 11' vehicle lanes, and	1.3	\$96,000	
					6' and 8' bike lanes up and downhill, respectively		inc	
Bosworth	Lyell	Cayuga		III	Install signing and pavement legends	0.25	inc	
Vicente	Grt Hwy	Lower Great Hwy		I	Build bicycle path to access Great Highway	0.05	\$16,000	*
Vicente	Lower Great Hwy	14th Ave		BPS	Modify STOP signs, traffic calm if necessary	2.1	\$2,400	
15th Ave	Vicente St	Ulloa		BPS	Modify STOP signs, traffic calm if necessary	0.4	inc	
Ulloa	15th Ave	Forest Side		BPS	Modify STOP signs, traffic calm if necessary		inc	
Forest Side	Ulloa	Taraval		BPS	Modify STOP signs, traffic calm if necessary		inc	
Taraval	Forest Side	Dewey		BPS	Modify STOP signs, traffic calm if necessary		inc	



Ocean Ave	21st Ave	Geneva		III	Install signing and pavement legends	1.6	\$5,400	
Geneva	Ocean	Aleman		III	Install signing and pavement legends	0.6	\$2,000	
Geneva	Allemany	Mission	70'	II	Re-stripe auto lanes to 10' and stripe 6' bike lanes	0.1	\$4,300	
Geneva	Mission	County Line	70'	II	Stripe 7' bike lanes	1.3	\$24,000	

Font Blvd	Lake Merced	Holloway		III	Install signing and pavement legends	0.3	\$1,000	
Holloway	Font Blvd	Junipero Serra		III	Install signing and pavement legends	0.5	\$1,700	
Holloway	Junipero Serra	Harrold Ave		BPS	Modify STOP signs, traffic calm if necessary	1.05	\$1,200	
Harrold Ave	Holloway	Ocean		BPS	Modify STOP signs, traffic calm if necessary	0.05	inc	

Silver Ave	Oakdale	Cayuga		III	Install signing and pavement legends	2.3	\$7,800	
	Allemany	Cayuga		I	Modify park path to accomodate bicycles	0.05	\$12,000	
Cayuga	Silver Ave	Foote Ave		BPS	Modify STOP signs, traffic calm if necessary	1.6	\$1,800	
Foote Ave	Cayuga	Aleman		BPS	Modify STOP signs, traffic calm if necessary	0.05	inc	
Allemany	Foote Ave	San Jose		III	Install signing and pavement legends	1.6	\$5,400	
San Jose Blvd	Allemany	Mission St		III	Install signing and pavement legends	0.5	\$2,000	
Brotherhood Way	San Jose Ave	Arch St		III	Install signing and pavement legends	0.3	\$1,000	
Sagamore St	Brotherhood	Sickles		III	Install signing and pavement legends	0.5	\$1,700	
Sickles	Sagamore	Allemany		III	Install signing and pavement legends	0.1	inc	

Evans Ave	Rankin	Hunter's Point		III	Install signing and pavement legends	1.5	\$5,100	
Hunter's Point	Evans	Innes		III	Install signing and pavement legends	0.3	\$1,000	
Innes	Evans Ave	Donahue		III	Install signing and pavement legends	0.6	\$2,000	
Donahue	Inness	Lockwood St		III	Install signing and pavement legends	0.15	inc	
Lockwood St	Donahue	Fisher		III	Install signing and pavement legends	0.3	\$1,000	
Fisher	Lockwood	Spear		III	Install signing and pavement legends	0.2	inc	
Spear	Fisher	Crisp		III	Install signing and pavement legends	0.3	\$1,000	
Crisp	Spear	Palou		III	Install signing and pavement legends	0.6	\$2,000	
Oakdale	Bayshore Blvd	Phelps		III	Install signing and pavement legends	0.8	\$2,700	
Palou	Phelps	Griffith		III	Install signing and pavement legends	1.1	\$3,700	

Great Hwy	County line	Sloat Blvd		WC	Maintain wide curb lanes	2.1	\$0	
Great Hwy	Sloat Blvd	Lincoln Blvd		WC	Maintain wide shoulders		\$0	
Great Hwy	Lincoln Blvd	Point Lobos		WC	Maintain wide curb lanes		\$0	
Great Hwy	Lincoln Blvd	Sloat Blvd.		I	Widen the existing bicycle path (2-4 ft)	2.1	\$99,000	*

34th Ave	Lincoln Way	Lake Merced		BPS	Modify STOP signs to assist bicyclists, install signals at Lincoln, Lk Me	2.5	\$233,000	
Lake Merced	Bike Path			I	Widen bike paths on Lake Merced Blvd and John Muir Dr (4')	4.2	\$265,000	*
					Pave access for bikes over South Lake bridge		inc	



Table 3-1

DESCRIPTION OF RECOMMENDED IMPROVEMENTS AND COST ESTIMATES

Lincoln Blvd	G.G. Bridge	25th Ave		III	Install signing and pavement legends	1.6	\$5,400	
23rd Ave	Lake St	Fulton		BPS	Modify STOP signs to assist bicyclists, install signal at Geary	1	\$116,000	
G.G. Park	Fulton St	Traverse		I	Build a bicycle path to connect 23rd Ave with Traverse	0.05	\$16,000	*
Traverse	Path	Path		III	Install signing and pavement legends	0.5	\$1,700	
G.G. Park	Traverse	Lincoln		I	Widen existing path and warn motorists of bicycle x-ing	0.05	\$12,000	
20th Ave	Lincoln Blvd	Wawona St		BPS	Modify STOP signs, traffic calm if necessary	2.1	\$2,400	
Stern Grove	Wawona St	21st Ave		I	Build bicycle path along park perimeter to connect 20th Ave.	0.3	\$73,000	
					with 21st Ave. Install signal at Sloat and 21st		\$115,000	
21st Ave	Sloat Blvd	Ocean Ave		BPS	Modify STOP signs, traffic calm if necessary	0.15	inc	
20th Ave	Ocean Ave	Buckingham Way		III	Install signing and pavement legends	0.5	\$1,700	
Buckingham Way	20th Ave	19th Ave		III	Install signing and pavement legends	0.05	inc	
19th Ave	Buckingham Way	SFSU service rd.		I	Build separated bicycle path on westside of 19th Ave and	0.5	\$52,000	
					prohibit parking for approx. one block.		inc	

Lincoln Blvd	Crissy Field Ave	Crissy Field Ave		II	Stripe bike lanes and widen as needed	0.5	\$9,100	
Crissy Field Ave	Lincoln Blvd	Arguello Blvd		II	Stripe bike lanes and widen as needed	0.2	\$3,300	
Arguello Blvd	Crissy Field Ave	Lake St		II	Stripe bike lanes and widen as needed	1.1	\$20,000	
Arguello Blvd	Lake St	Fulton St	66'	II	Remove one travel lane and re-stripe 7' bike lanes	0.9	\$71,000	
W.Conservatory	Arguello Blvd	JFK Drive		III	Install signing and pavement legends	0.05	inc	
E. Conservatory	Arguello Blvd	JFK Drive		III	Install signing and pavement legends (one way)	0.05	inc	
3rd Ave	Lincoln	Hugo		III	Install signing and pavement legends	0.05	inc	
7th Ave	Hugo St	Laguna Honda		III	Install signing and pavement legends	0.7	\$2,400	
Laguna Honda	7th Ave	Clarendon	40'	II	Re-stripe to narrow median to 4' for 11' vehicle lanes, and	0.3	\$17,000	
					6' and 8' bike lanes up and downhill, respectively		inc	
Laguna Honda	Clarendon	Plaza	50'	II	Eliminate parking as necessary and re-stripe with	0.2	\$3,600	
	plaza	woodside			bike lanes from Clarendon	0.1	inc	
Dewey Blvd.	Laguna Honda	Taraval	50'	II	Stripe bike lanes	0.4	\$7,400	
Claremont	Dewey Blvd	Portola		III	Install signing and pavement legends,	0.3	\$1,000	
					remove stop sign at Ulloa		inc	
Santa Clara	Portola	Monterey		III	Install signing and pavement legends	0.5	\$1,700	
San Benito	Monterey Blvd	Ocean		III	Install signing and pavement legends	0.3	\$1,000	
Ocean	San Benito	Cedro Ave		III	Install signing and pavement legends	0.1	inc	
Mercedes Way	Cedro Ave	Lunado Way		III	Install signing and pavement legends	0.05	inc	
Lunado Way	Mercedes Way	Holloway		III	Install signing and pavement legends	0.3	\$1,000	
Beverly	Holloway Ave	19th Ave		III	Install signing and pavement legends	0.4	\$1,400	
19th Ave	Beverly	Randolph		III	Install signing and pavement legends	0.2	inc	
Randolph	19th Ave	Arch St		III	Install signing and pavement legends	0.1	inc	
Arch St	Allemany	Randolph		III	Install signing and pavement legends	0.3	\$1,000	
Allemany	Arch St	St. Charles St		III	Install signing and pavement legends	0.2	inc	
St. Charles	Daly City BART	Allemany		III	Install signing and pavement legends	0.3	\$1,000	



Presidio	Pacific Ave	Geary Blvd		III	Install signing and pavement legends	0.6	\$2,000	
Geary Blvd	Presidio	Masonic	LT 24'	III	Re-stripe two 10' left turn vehicle lanes and add	0.02	inc	
					4' bicycle left turn lane westbound for 100 feet		inc	
Masonic	Geary Blvd.	Panhandle		III	Install signing and pavement legends	0.7	\$2,400	
Panhandle	Ashbury	Clayton		I	Build bicycle path to connect existing path to	0.05	\$24,000	
					Ashbury and Clayton		inc	
Clayton St	Oak St	Waller St		III	Install signing and pavement legends	0.15	inc	
Ashbury St	Oak St	Clayton St		III	Install signing and pavement legends	0.7	\$2,400	
Waller St	Clayton St	Downey St		III	Install signing and pavement legends	0.3	\$1,000	
Downey St	Waller St	Ashbury St		BPS	Modify STOP signs, traffic calm if necessary	0.4	inc	
Clayton St	Ashbury St	Corbett St		III	Install signing and pavement legends	0.3	\$1,000	

Eureka St	17th St	23rd St		BPS	Modify STOP signs, traffic calm if necessary	0.7	inc	
23rd St	Eureka St	Diamond St		BPS	Modify STOP signs, traffic calm if necessary	0.05	inc	
Diamond St	23rd St	Elizabeth St		BPS	Modify STOP signs, traffic calm if necessary	0.05	inc	
Elizabeth St	Diamond St	Sanchez St		BPS	Modify STOP signs, traffic calm if necessary	0.35	inc	
Sanchez St	Elizabeth St	30th St		III	Install signing and pavement legends	0.7	\$2,400	
30th St	Sanchez St	Chennery St		III	Install signing and pavement legends	0.2	inc	

Church St	Herman St	Duboce		III	Install signing and pavement legends	0.05	inc	
Herman St	Webster	Church		BPS	Modify STOP signs, traffic calm if necessary	0.05	inc	
Webster St	Herman St	Grove St		III	Install signing and pavement legends	0.5	\$1,700	
	Grove St	Bush St	92'	II	Restripe center lane to 11', add 7' parking and 6' bike lane	0.7	\$22,000	
	Bush St	Clay St		III	Install signing and pavement legends	0.5	\$1,700	
	Clay St	Broadway St		BPS	Modify STOP signs, traffic calm if necessary	0.5	inc	

Valencia St	Market St	Tiffany St	62'6"	II	Remove travel lane and stripe bike lanes in both directions	1.8	\$92,000	
Tiffany St	Valencia St	29th St		BPS	Modify STOP signs, traffic calm if necessary	0.2	inc	
29th St	Tiffany St	Chennery St		BPS	Modify STOP signs, traffic calm if necessary	0.3	inc	
Chennery St	29th St	Diamond St		BPS	Modify STOP signs, traffic calm if necessary	0.75	inc	
Diamond St	Chennery St	Center St		BPS	Modify STOP signs, traffic calm if necessary	0.1	inc	
Center St	Diamond St	Hearst		III	Install signing and pavement legends	0.3	\$1,000	
Hearst St	Center St	Genessee		BPS	Modify STOP signs, traffic calm if necessary	0.7	inc	
Genessee	Judson St	Monterey		BPS	Modify STOP signs, traffic calm if necessary	0.25	inc	
Monterey Blvd	Genessee	San Benito		III	Install signing and pavement legends	1.1	\$3,700	
14th Ave	Vicente	Portola		BPS	Modify STOP signs, traffic calm if necessary	0.3	inc	

Polk St	Golden Gate	Vallejo St	44'9"	II	Remove one Southbound traffic lane, and	1.2	\$60,000	
					Stripe bike lanes (5'4")		inc	
Polk St	Vallejo	Northpoint	44'9"	II	Stripe bike lanes (5'4")	0.6	\$11,000	
Gough St	Turk St	Market St		III	Install signing and pavement legends	0.6	\$2,000	



Table 3-1
DESCRIPTION OF RECOMMENDED IMPROVEMENTS AND COST ESTIMATES

Howard St	Embarcadero	11th St		II	Remove one vehicle lane and re-stripe with 6' bike lane	2	\$130,000	
Folsom St	Embarcadero	Essex		II	Restripe for 10' travel lanes and 6' bike lane	0.6	\$48,000	
Folsom St	Essex	11th St		II	Stripe to include one way 6' bike lane	1.4	\$13,000	
11th St	Howard St	Harrison St		II	Stripe 7' bike lanes	0.3	\$5,800	
Harrison St	11th St	14th St		II	Re-stripe to provide bike lanes	0.2	\$12,000	
Harrison St	14th St	16th St		II	Stripe 6' bike lanes	0.2	\$3,600	
Harrison St	16th St	22nd St		II	Re-stripe to eliminate one southbound lane and	0.7	\$43,000	
					stripe 7' bike lanes and 12' travel lanes		inc	
Harrison St	22nd St	Army St		II	Stripe bike lanes 8'	0.6	\$11,000	
Townsend	3rd St	4th St		II	Remove one travel lane westbound and stripe bike lanes	0.175	\$13,000	
	4th St	Division		II	Stripe bike lanes along Townsend in both directions	0.85	\$15,000	
Kansas St	Division	17th St		III	Install signing and pavement legends	0.4	\$1,400	
Potrero St	17th St	23rd St	82'	WC	Re-stripe 10' travel lanes and wide curb lanes	0.73	inc	
23rd St	Potrero St	Kansas St		III	Install signing and pavement legends	0.25	inc	
Kansas St	23rd St	Vermont		III	Install signing and pavement legends	0.3	\$1,000	
Vermont St	Kansas St	Army St		III	Install signing and pavement legends, and traffic signal	0.05	\$115,000	
Hampshire	northside of Army	Southside of Army		I	Bikes can use existing pedestrian overpass to connect to bike path		inc	
Bayshore Blvd	Army St	500 feet south		I	Construct bike path from ex. path south to Bayshore Blvd.	0.1	\$299,000	*
Bayshore Blvd	Edge of path	Kirkwood		III	Install signing and pavement legends	0.25	inc	
Bayshore Blvd	Kirkwood St	Industrial St		WC	Maintain and enhance wide curb lanes as necessary	0.8	\$2,700	
Bayshore Blvd	Industrial St	Silver Ave		III	Install signing and pavement legends	3	\$10,000	
San Bruno	Silver	Bayshore Blvd.		III	Install signing and pavement legends		inc	
Bayshore	San Bruno	County line		III	Install signing and pavement legends		inc	
Tunnel Ave	Bayshore	County Line		III	Install signing and pavement legends	.3+	\$1,000	
Stockton St	Broadway	Market St		III	Install signing and pavement legends	0.6	\$2,000	



Embarcadero	Northpoint St	King St		II	Stripe 6' bike lanes in either direction	2	\$49,000	
King St	Embarcadero	3rd St		II	Stripe bike lanes	0.3	\$7,300	
3rd St	King Street	Mariposa		II	Stripe bike lanes in both directions	1.2	\$31,000	
Mariposa	3rd St	Tennessee		III	Install signing and pavement legends	0.05	inc	
Tennessee St	Mariposa St	22nd St		III	Install signing and pavement legends	0.5	\$1,700	
22nd St	Tennessee St	Indiana St		III	Install signing and pavement legends	0.3	\$1,000	
Indiana St	Tennessee	Army St		III	Install signing and pavement legends	0.7	\$2,400	
Indiana St	Army St	Tulare St		I	Build separated two way bicycle path	0.15	\$36,000	
Bridge	Tulare St	Napolean St		I	Construct two way bicycle/pedestrian bridge	0.05	\$575,000	
Rankin St	Napolean St	Evans Ave		III	Install signing and pavement legends	0.15	inc	
Kieth Ave	Palou	Carrol		III	Install signing and pavement legends	0.6	\$2,000	
Ingalls	Carrol	Hunter's Point Ave		III	Install signing and pavement legends	0.2	inc	
Carrol Ave	Kieth	Fitch		III	Install signing and pavement legends	0.6	\$2,000	
Gillman	Fitch	Hunter's Point		III	Install signing and pavement legends	0.4	\$1,400	
Hunter's Point	Candlestick	Gillman		III	Install signing and pavement legends	0.3	\$1,000	
Phelps St	Palou	Evans		III	Install signing and pavement legends	0.6	\$2,000	

GRAND TOTAL

137 \$5,557,000

/1/ Costs based on per unit base construction costs from the Department of Public Works and the Department of Parking and Traffic.

All costs include a 15 percent factor for project management, administration and contingencies. Those projects marked with a * include an additional 30 percent factor for design, construction management and contingencies.

inc - cost included in the segment above.



4. IMPLEMENTATION

This chapter addresses the phasing, required City staffing, potential funding sources and other issues related to the implementation of the recommendations of the San Francisco Bicycle Plan.

PHASING OF THE RECOMMENDED BIKEWAY NETWORK

The two issues related to rating routes for implementation are the priority of the route and the actual scheduling of the improvements. The priority of the route is based on a qualitative assessment of the benefit that it would accord to bicyclists in terms of safety or convenience. Of course, all recommended routes provide significant benefits to bicyclists, but Priority 1 routes should be implemented, where possible, before Priority 2 routes.

While some routes have higher priority than others due to needed safety and convenience improvements, some segments of routes may be more practical to implement sooner than others due to fewer physical, funding, design, public review, or approval constraints related to the type of recommendation involved. Thus, an estimate of the time frame in which certain types of improvements can be completed has been made. This estimate is based on past experience in getting required approvals, completing design drawings (if any), acquiring funding, and construction. These estimates assumed that the recommendations for a Bicycle Unit within DPT (described later in this chapter) are adopted. With the City's current staffing, these time estimates may be optimistic. Phase I includes those routes or sections of routes that can be implemented within one year from plan adoption. Phase II routes or sections of routes will probably take between one and three years to be implemented due to some in-house review and approvals that may need to be conducted before the project gets underway. Phase III routes or sections of routes will probably take more than three years due to additional studies that must be conducted, the time it takes to acquire funding from outside City sources, and/or the political support that must be achieved.

Table 4-1 presents the routes by priority. A table detailing which types of improvements can be completed in which phase is contained in Appendix C.

Table 4-1**IMPLEMENTATION PRIORITIES OF PROPOSED BIKEWAY ROUTES****Priority 1**

- ▶ Army St./Clipper St./Portola Dr./Sloat Blvd.
- ▶ Duboce "Wiggle"/John F. Kennedy Dr.
- ▶ The Embarcadero/Third St./Candlestick
- ▶ Fifth St./Turk St./Golden Gate Ave./Cabrillo St.
- ▶ Font Blvd./Holloway Ave.
- ▶ Howard St./Folsom St./Harrison St.
- ▶ Kirkham St./Sunset Spur - Kezar Path/Page St.
- ▶ Northpoint St./Marina Blvd./Old Mason St.
- ▶ Polk St.
- ▶ Townsend St./Kansas St./Potrero Ave./Bayshore Blvd.
- ▶ Valencia St./Tiffany Ave./Chenery St./Diamond St./((City College) Monterey Blvd./14th Ave.
- ▶ Washington Blvd./Arguello Blvd./7th Ave./Laguna Honda Blvd/Dewey Blvd./S.F. State University
- ▶ Winston/Steiner/Sanchez/Third Street
- ▶ 17th St./16th St.
- ▶ 23rd Ave./Transverse Dr./20th Ave./S.F. State University

Priority 2

- ▶ Broadway/Pacific Ave./Clay St./Lake St.
- ▶ California/Taylor/Pacific
- ▶ Cayuga St./Silver Ave.
- ▶ Corbett/Jersey/Chattanooga/22nd
- ▶ Eureka St./Elizabeth St./Sanchez St.
- ▶ Francisco St./Bay St./Francisco St./Lombard St./Greenwich St.
- ▶ Great Highway
- ▶ Hunters Point Loop
- ▶ Market St./Corbett Ave.
- ▶ Ocean Ave./Geneva Ave.
- ▶ O'Shaughnessy Blvd./Woodside Ave.
- ▶ Presidio Ave./Masonic Ave./Downey St./Ashbury St./Corbett Ave.
- ▶ Stockton St.
- ▶ Sutter St./Post St.
- ▶ Vicente St.
- ▶ Webster St.
- ▶ 34th Ave./Lake Merced Blvd./John Muir Dr.

IMPLEMENTATION STRATEGY FOR BICYCLE SAFE STREET DESIGN GUIDELINES

The design guidelines that are recommended as part of the San Francisco Bicycle Plan can only benefit the City and its residents if they are implemented. At the very least, the improvements discussed herein should be implemented when a street is resurfaced or reconstructed. Since streets are resurfaced or reconstructed every 15 to 25 years, theoretically, in 25 years all streets in San Francisco would conform to the standards set forth in this chapter. However, the City can and should undertake strategies to ensure that all streets and roadways meet the design standards as soon as possible.

The key to a successful implementation strategy, as evidenced by the experience of other cities, has been making bicycle planning considerations a routine part of the on-going planning and design phases of capital construction projects. In particular, the inclusion of bicycle design standards must be at a phase sufficiently early in the project's development that there are no adverse cost implications that might curtail their inclusion.

The recommendations below suggest a series of strategies that will raise the level of awareness of City employees regarding bicycle design standards and that will enable bicycle issues to be considered as early as possible in a project's timetable. As discussed in the previous chapter, additional staffing is necessary to ensure that all these recommendations can be implemented.

Continuation and Expansion of the Spot Improvement Program - The existing Spot Improvement program should be continued indefinitely. It is recommended that the card to report suggestions could be modified to solicit input on railroad track crossing locations in need of rubberized flange filler or locations in need of right-turn stencils and warning signs. A dedicated annual budget for such improvements for the Spot program would not only ensure that annual progress was being made in providing safer streets in San Francisco, but would also help the City defend itself in any potential liability case.

Quarterly Review Meetings - Responsibilities for the implementation of a transportation capital construction project are divided among several City agencies, depending upon the type of project. Although the great majority of the work is managed by the Department of Public Works, other agencies such as the Public Transportation Commission, the Port of San Francisco, the San Francisco Redevelopment Agency, the San Francisco County Transportation Authority, the Planning Department, the Recreation and Park Department, and the Department of Parking and Traffic all play roles in early planning decisions.

This plan recommends that the Bicycle Coordinator chair a quarterly coordination meeting that is totally dedicated to the inclusion of bicycle design standards in the early phases of project development. Project managers from each of the cited departments should attend as appropriate to the pre-published and circulated agenda.

This quarterly meeting could be used to improve interdepartmental coordination regarding maintenance problems particularly related to bikeways.

Bicycle Design Standards Summary Brochure - A brief summary document that includes the key recommendations of the design standards should be developed and distributed to City departmental project managers. This brochure could include blank spaces that the Bicycle Coordinator, or his staff, could tailor to the specific street segments that are impacted by these design standards. At a minimum, this brochure should be distributed to all project managers who are responsible for projects along the designated bike routes.

Computerized Design Standard Elements - The recommendations of the Bicycle Plan could be computerized and systematically compared against annual departmental capital recommendations for the initiation of planning and design work. The Spot Program recommendations could also be used as input to this system of evaluation. The development and implementation of such a system might rely upon the current computerized project tracking system that is used by the Department of Public Works. The current system tracks schedule, project phase, and budget for all DPW projects. This comparative analysis would be an "overlay" of bicycle plan information, the output results illustrating where potential opportunities exist. In addition, the City's objective of moving towards a GIS mapping system for the entire City could include these improvements.

Pavement Management System - The Department of Public Works oversees the Pavement Management System. This is a program which systematically applies criteria to the City's roadway system, ranks the roadway system based on those criteria, and recommends an annual resurfacing program. The annual recommendations for this system should include a check-off list for those projects that are along designated bike routes or where recommended design standards are appropriate.

Redevelopment Districts - The City of San Francisco has currently designated seven areas of the City as "Redevelopment Areas". The development of plans for these areas includes infrastructure roadway improvements that provide an opportunity to accommodate bikeway improvements meeting the objectives established by the recommended design standards. As part of the quarterly bicycle coordinating committee meetings, the planned roadway improvements for the redevelopment district should be reviewed and compared to the recommended bicycle design standards.

Transit Preferential/Pedestrian Streets Program - Another component of the ½¢ sales tax program in San Francisco is the development of a network of pedestrian street improvements that encourage pedestrian movements as opposed to auto dependent access. The design standards that have been proposed as part of the Bicycle Plan should be reviewed with the Project Manager for the Transit Preferential and Pedestrian Streets Program. Where appropriate, changes should be made in currently proposed transit and pedestrian street programs to include recommendations contained in the bicycle design standards.

Signal Replacement Program - Another part of the San Francisco Transportation Authority's ½¢ transportation sales tax program is the replacement of obsolete signal equipment through the signal replacement program. This program is also developed on an annual basis that provides the Bicycle Coordinator with an opportunity to incorporate certain elements of the plan into the on-going signal replacement program.

CITY ORGANIZATION

Existing Structure

Currently, the administration and implementation of the City's bicycle facility program crosses the jurisdiction of various City departments. Elements of the City's program take place in the following Departments: Parking & Traffic, City Planning, Public Works, Recreation and Park, and Police. A Bicycle Coordinator position was established in July 1992 in the Department of Parking & Traffic (DPT) to direct bicycle improvements, coordinate with the Bicycle Advisory Committee (BAC) and pursue funding for bicycle programs.

Role of the Bicycle Coordinator

As discussed in Chapter 2, the Bicycle Coordinator currently oversees the bicycle activities and is key to the administration of the bicycle facility program. He prepares grant applications to finance bicycle programs and projects, and coordinates with various departments to plan, design and implement projects.

The Bicycle Coordinator is the project manager for implementing all bicycle projects. When the Bicycle Coordinator was hired in 1992, there was a three-year backlog of TDA projects that had not been implemented due to lack of staff. As a result of the creation of the Coordinator position, the implementation of Transportation Development Act (TDA) projects is on schedule.

The coordinator also works closely with the Bicycle Advisory Committee (BAC) to develop and prioritize projects. The Bicycle Coordinator is a member of various bicycle committees and participates in planning efforts for Golden Gate Park, the Presidio, and other projects.

Currently, the Bicycle Coordinator is classified by Civil Service as a Transit Planner III within the Department of Parking & Traffic. The coordinator has no assigned staff, except for temporary interns and the departmental clerical support. The continuation of the coordinator position is contingent upon the award of grants for future bicycle projects and programs, as he charges all of his time to these projects.

Bicycle Program Administration Issues

The City's bicycle program has become much more effective since the creation of the Bicycle Coordinator position. However, with the adoption of the Bicycle Plan, additional staff and resources will be required to administer the program as recommended. The Plan also requires coordination with other departments and staff in order to allow various bicycle-related activities to work together more effectively. When developing this recommended program coordination, the following issues were considered:

Staff Resources - With the current staff limited to the one Bicycle Coordinator position, opportunities for funding, projects, or activities are being missed. To ensure coordination of all activities and to pursue all potential funding opportunities, a larger staff, with expertise in bicycle planning, design engineering, safety, education/outreach, grant writing and fund-raising is needed.

There are many opportunities for increased funding for bicycle programs and facilities, but limited staff resources constrain the potential to pursue all of these opportunities.

Use of TDA Funds - Specific bicycle projects need to be identified and planned in order to receive TDA funds allocated for bicycle and pedestrian programs and to avoid the loss of these funds. If a strong case is not made for the need for coordinated and well thought out bicycle projects, then TDA funds may be reallocated to MUNI or DPW pedestrian projects. The City needs to make a commitment that a fixed percentage of TDA funds are committed to bicycle projects and will not be diverted to MUNI or DPW.

Citywide Coordination - It is essential for the Bicycle Coordinator to oversee any project which directly affects bicycling, to be involved in Citywide bicycle transportation policies, and to ensure coordination of activities among departments and organizations to maintain consistency. Examples of these three issues are:

- Many planning activities, conceptual designs, programs, and construction projects that contain bicycle elements occur without the involvement of the Bicycle Coordinator. Examples of projects and programs which directly affect bicycling but have had very limited involvement of the Bicycle Coordinator include: the redesign of the Embarcadero, the "routine" restriping and redesign of intersections, and bicycle registration.
- DCP is concerned about how the Bicycle Plan will be adopted and become policy for the City and County. The role of DCP in enforcing the plan would be weakened if the plan is not adopted in some form, such as incorporating the policies in the Master Plan. The adoption of the plan would also provide guidelines and standards for all departments and organizations to use when planning, incorporating or implementing bicycle projects and programs.
- The coordination of activities among the departments and organizations is important so that conflicts are avoided and consistency between plans is maintained. A historic example of a bicycle planning problem that occurred due to insufficient coordination was in the City's existing bikeway plan which was adopted in 1982 by the City Planning Commission. The bikeway plan shows a route around Lake Merced. Such a route would typically fall under the DRP. However, the Recreation and Parks commission did not approve the designation of the Lake Merced route. The Lake Merced path is essentially a two-way multi-purpose path, not a Class I bike path as indicated in the City's bikeway plan. There was no coordination or communication between DCP and DRP to assess the appropriateness or the impacts of designating this facility a Class I bike path.

Organizational Options

Additional staffing is needed to plan, construct and secure funding for all projects and programs in the Bicycle Plan. The City could lose opportunities to maximize funding for bicycle projects and programs unless an organization within the City is created to implement the Bicycle Program. A number of organizational options were examined. The options considered are summarized below:

- Continue the existing role of the Bicycle Coordinator, using a matrix organization with defined relationships between that person and others in various organizations. The coordinator would work with designated staff from other departments to coordinate activities.
- Develop a bicycle unit (composed of several staff members) which would report through one of the departments or possibly the proposed Department of Transportation (that would be overseen by the City's new Transportation Commission). This unit would be a multi-disciplinary group in one department responsible for bicycle activities. The staff would need to have expertise in planning and grant funding as well as technical design and implementation skills. The bicycle unit might require task-ordered assistance through other departments, such as the construction expertise of the Department of Public Works.
- Develop an interdepartmental bicycle task force which is required to review all decisions that might affect bicycle facilities and/or policies. The task force would be formed by utilizing the existing Bicycle Coordinator as head and appointing staff members to the task force from related departments. For example, a representative on the task force might come from DPW, DPR, DCP, MUNI, or the Police Department.

To aid in making a recommendation for an effective organizational structure for the bicycle unit, a review of five successful bicycle programs was conducted. The results, shown in Table 4-2, indicate that the bicycle program in each of these cities was located within a related city department, such as engineering, transportation or public works. The bicycle programs in three of the five cities were part of the city traffic division. The number of staff and type of funding varied, but all staff had responsibility for grant-writing, funding, and program implementation.

Recommended Organization

Based upon the organization options described above and review of successful programs in other cities, the following Bicycle Program administrative structure is recommended.

Administration of the bicycle program for the City and County of San Francisco will require coordination with other City departments, volunteer groups and citizens who want to utilize bicycle facilities. The Bicycle Coordinator will oversee the activities which are associated with implementing bicycle projects and programs in San Francisco. The Bicycle Plan will require ongoing program administration, planning, oversight, grant-writing, promotion, and maintenance. Since these activities cover a wide range of disciplines and will require coordination with other departments and staff, a bicycle staff "unit" within one department is recommended. The staff will need to have the skills required to implement the bicycle program. However, it is not necessary for each staff member to be skilled in all areas.

A core of bicycle staff within a single department would provide the strongest bicycle program. The Bicycle Coordinator should manage this staff. Department of Parking and Traffic (DPT) should continue in the coordination of bicycle activities by creating a bicycle unit. Enlarging and centralizing the bicycle coordination function is not intended as a substitute for cross department



Table 4-2

STAFF ORGANIZATIONS FOR VARIOUS BICYCLE PROGRAMS
San Francisco Bicycle Plan

City (Population)⁽¹⁾	Staff Person and Title	Department	Division	Bicycle Staff	Staff Funding Source	Grant Writing Responsibility
Seattle (520,000)	Pete Lagerway - Bicycle Coordinator	Engineering	Traffic Section - Bicycle & Pedestrian	5 Full Time 2 Part-Time	100% Project Funded	Bicycle Coordinator and staff
San Diego (1,149,000)	Michael Jackson - Bicycle Coordinator	Engineering	Traffic Engineering Division	1 Full-Time	100% General Fund	Bicycle Coordinator, assisted by other division staff
Tucson (415,000)	Keith Walzak - Alternative Modes Coordinator	Transportation	Division of Transportation Planning	1 Full-Time	100% General Fund	Alternative Modes Coordinator
Portland (445,000)	Mia Birk - Bicycle Program Coordinator	Transportation	Bureau of Traffic Management - Striping & Signage Division	1 Full-Time 2 Part-Time	60% Transportation Revenues 40% Projects	Bicycle Coordinator and staff as needed
Eugene (116,000)	Diane Bishop- Bicycle and Alternative Modes Coordinator	Public Works	Transportation Division	1 Full-Time	80% Transportation Revenues 20 % General Funds	Alternative Modes Coordinator

(1) 1992 Population statistics
Source: Nelson\Nygaard, January 1995

Wilbur Smith Associates; February 1995

coordination. Talents from other departments will continue to be required and would be task ordered as needed to the bicycle unit.

It is recognized that there are inherent limits in the civil service hiring system which could result in a planner or traffic engineer not being a bicycle advocate. It is hoped that if this is the case that the staff would support and become an advocate of the bicycle program since that would be the department they would be working in. This report is not recommending that a new civil service classification be established.

The following recommendations for staffing are designed to meet the extent of activities outlined in the Bicycle Plan:

- The Bicycle Coordinator should be a supervisory position, Transit Planner IV or higher. The Coordinator would manage bicycle projects, be responsible for coordinating activities with other City departments and agencies, and seek funding. The Bicycle Coordinator would also manage the staff within the bicycle group.
- Subordinate staff to be supervised by the Coordinator would include a full-time Planner position, a part-time Traffic Engineer and a part-time Management Assistant, for a total of two full-time equivalent employees.
 - ▶ The Planner would be a Transit Planner I or II position who would manage small bicycle projects, such as implementation of a traffic-calming measure. The Planner would also participate in planning, education, and enforcement activities, as necessary, and provide day-to-day support to the Bicycle Coordinator.
 - ▶ The Engineer would be a Junior Transportation Engineer or an Assistant Transportation Engineer. The Engineer would review project plans for bicycle-related concerns, manage bicycle-related maintenance, signage, and traffic activities, and coordinate the spot improvement program. The Engineer would also provide support to the Bicycle Coordinator in managing projects.
 - ▶ The Management Assistant would provide grant-writing assistance to the Bicycle Coordinator. There are significant resources for securing funding for a variety of bicycle-related projects that currently can not be sought due to staff and time constraints. The Management Assistant would work with the Bicycle Coordinator, other City departments and volunteer groups to produce applications for funding. For example, the Management Assistant could work with the City's Department of Health to gather input for compiling a grant application for bicycle safety training.
 - ▶ It is recommended that the bicycle staff positions be funded by a combination of General Fund revenues and project funding. A review of other bicycle program structures shows that most programs have some support from the City's general fund (see Table 4-2). This indicates that the City has a commitment to supporting bicycle projects and programs and demonstrates their support by providing a small portion of the funding. Several programs fund 100 percent of staff costs from general funds. The recommended strategy for the San Francisco

program would be 25 percent general funds and 75 percent project funding. This funding would be a way for the City of San Francisco to show their support for the use of the bicycle as a means of transportation.

Activity Involvement

Table 4-3 presents a list of activities to be performed to fully implement the recommendations of the San Francisco Bicycle Plan. These activities have been categorized and proposed staff have been assigned to show how these positions would function.

In addition, Chapter 5 discusses in more detail how bicycle-related planning should be incorporated into other City departments.

FUNDING

The next two sections describe in more detail existing and potential funding sources to implement the various recommendations of this plan. The plan components and the options for funding the proposed projects and programs are presented in Table 4-4.

TRADITIONAL FUNDING

Traditional Funding Sources

Outside funding plays a crucial role in implementing bicycle projects and programs. This is especially true in San Francisco, which unlike other major U.S. cities, does not currently budget any funds from the general fund for the Bicycle Program.

Specific outside bicycle funding is limited. However, there are other more general funding sources than can be used to fund some bicycle projects and programs. Many of these funding sources can only be used for bicycle projects under very specific conditions and/or in conjunction with other projects. Table 4-5 lists both bicycle-specific and general funding sources that may be able to be used to fund bicycle projects and programs. They are listed by funding source (City of SF, Regional, State, and U.S.) and then by funding program within each source category. When there was uncertainty as to whether a specific funding source was applicable to San Francisco, it was included, rather than eliminated.

The large number of potential funding sources presents quite a challenge to San Francisco. Each source of funds is limited to certain projects and has its own unique application procedures. Since the San Francisco bicycle program is run by one person, he can only allocate part of his time to writing grant applications. Therefore, the amount of potentially available traditional funds is severely limited by the small amount of time available to the Bicycle Coordinator to apply for these funds. It should be noted that despite these time constraints, he has been successful in every grant application that he has filed. The following grants have been obtained by San Francisco in the past two years:



Table 4-3
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CITY OF SAN FRANCISCO BICYCLE UNIT(1)
San Francisco Bicycle Plan

Activities	Bicycle Coordinator	Planner	Engineer	Analyst	Other Dept./Staff
Bicycle Program Administration					
▶ Interdepartmental Bicycle Task Force	✓	✓	✓	✓	City Staff
▶ Future Bicycle Planning	✓	✓			
▶ Identify Funding Sources	✓			✓	
Maintenance					
▶ Spot Improvement	✓		✓		DPW/DRP
▶ Adopt & Enforce Maintenance Standards	✓		✓		DPW/DRP
▶ Bicycle Path Maintenance	✓		✓		DPW/DRP
▶ Create and Maintain Maintenance Database		✓	✓		DPW/DRP
Policies					
▶ Revise & Amend City Traffic Code	✓	✓			DPT/PD
▶ Legislation Requests	✓	✓			VGs
▶ Develop & Adopt Local Ordinances to Support Bicycling	✓	✓			DPT/ECC/ PD/VGs
Bicycle Safety/Education/Enforcement					
▶ Develop Educational Strategy for Children/Motorists/Cyclists	✓	✓			DRP/SFPD/ VGs
▶ Create Media Awareness	✓	✓			VGs/BGs
▶ Secure Funding for Educational Programs	✓			✓	BGs
▶ Awareness Training for City Staff	✓	✓	✓		DPT/DPW/PD
▶ Enforcement Procedures	✓				SFPD/VGs



Table 4-3
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CITY OF SAN FRANCISCO BICYCLE UNIT(1)
San Francisco Bicycle Plan

Activities	Bicycle Coordinator	Planner	Engineer	Analyst	Other Dept./Staff
Traffic Calming Measures					
► Design Guidelines	✓	✓	✓		DPT/DPW/ PD/VGs
► Priority Street Designations	✓	✓	✓		DPT/DPW/ PD/VGs
► Secure Funding for Improvements	✓		✓	✓	
Bicycle Parking & Building Access					
► Establish Requirements, Policies and Design Guidelines for Bicycle Parking	✓	✓	✓		DPW/DPR/ PD/VGs/BGs
► Pursue Bicycle Access on Transit Systems and Bridges	✓	✓			MUNI/VGs/ PD
► Bicycle Parking Implementation including Transit Site Parking	✓	✓	✓		PD/DPW
► Secure Funding for Parking		✓		✓	BGs
Bicycle Street Network					
► Adopt Approved Bikeway Network	✓				DPT/DPR/ PD/VGs
► Identify Bikeway Network Enhancement to Recreational, Public Access and Trail Areas	✓	✓	✓		DPW/DPR/PD
► Implement Improvements Required	✓		✓		DPW/DRP
► Adopt & Implement Consistent Signage for City's Bikeway Network	✓	✓			PD/DPT/DPW/ VGs/DRP
Bicycle Promotion					
► Identify Target Populations & Develop Promotional Materials	✓	✓			VGs/BGs
► Develop List of Activities & Secure Funding Sources	✓	✓		✓	VGs/BGs
► Develop & Implement Employer Outreach Program		✓			BGs/ECC
► Bicycle Commuting Promotion & Incentives		✓		✓	ECC/BGs



Table 4-3
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CITY OF SAN FRANCISCO BICYCLE UNIT(1)
San Francisco Bicycle Plan

Activities	Bicycle Coordinator	Planner	Engineer	Analyst	Other Dept./Staff
Bicycle Planning					
► Review Bicycle Plans	✓	✓	✓		PD/VGs
► Review City Plan for Bicycle-Related Concerns	✓	✓			PD/VGs

Source: Nelson\Nygaard, January 1995

(1) = Bicycle Unit Staff includes: bicycle coordinator, planner, engineer and analyst.

BGs = Business Groups
DPT = Department of Parking & Traffic
DPW = Department of Public Works
DRP = Department of Recreation and Parks
ECC = Employee Commute Coordinator
MUNI = S.F. Municipal Railway
PD = Planning Department
SFPD = San Francisco Police Department
VGs = Volunteer Groups (e.g. SFBAC, SFBC).

Wilbur Smith Associates; February 1995



Table 4-4
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PROJECT AND PROGRAM COSTS VS. FUNDING SOURCES
San Francisco Bicycle Plan

Project or Program	Description	Estimated Cost	Potential Funding Source
Bikeway Network	135 miles (see Chapter 3)	\$5,500,000 ⁽¹⁾	TA/TDA/ISTEA/AB434
Parking - Neighborhood Retail	2,000 on-street racks (see text)	\$400,000 ⁽²⁾	ISTEA/TDA
Parking - Garages	Racks and Lockers	\$120,000	TDA/AB 434
Parking - Downtown Multi-Service Center	Attendant Parking and Service Center	\$50,000 to \$250,000	JV
Parking - Transit Stations	Lockers, Other Class I	\$50,000 to \$500,000	Transit Agency/ISTEA TDA/AB 434
Parking - On-Site Private Employers	Racks and Lockers	Varies	Employers TDA
Inspectors	Existing Staff	---	CP - DPW
Maintenance - Sweeping	Existing Staff	---	CP - DPW
Safety/Education	See Text (Chapter 9)	\$41,000	Grant/TDA/FR ⁽³⁾
Motorist Education	See Text (Chapter 9)	\$40,000	Grant/TDA/FR
Traffic School	See Text (Chapter 9)		SS
Scenic Bike Map	Distributed to Tourists	\$10,000	CVB/Bike Shops
Bike Network Map	Distributed to Residents/Commuters	\$10,000	TDA or SS
Promotion	See Text (Chapter 10)	\$10,000 - \$100,000	Sponsors/Grants/ FR
Bike Racks on Transit	Racks on Buses	\$100,000 to \$1,000,000	CMAQ
Rubberized Railroad Track Crossings	At all intersections with active train/trolley tracks	\$9,000,000 ⁽⁴⁾	OTS
Miscellaneous Safety Improvements	Such as the Spot Improvement Program	\$100,000 annually	TA TDA



Table 4-4
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PROJECT AND PROGRAM COSTS VS. FUNDING SOURCES
San Francisco Bicycle Plan

- (1) = Assumes minimal expenditures of \$1,000 per mile for Traffic Calming improvements. The actual cost may vary tremendously depending on the types of projects implemented. Landscaped traffic circles and speed humps alone cost about \$4,000 per installation.
- (2) = Assumes \$200 per bike space.
- (3) = Fundraising (see text).
- (4) = Assumes \$430 per track foot, 100 track feet per intersection, 200 intersections.

- AB 434 = Assembly Bill 434
- CMAQ = Congestion Mitigation Air Quality Program, ISTEA
- CP = Current Program
- CVB = Convention and Visitors Bureau
- DPW = Department of Public Works
- FR = Fundraising (see text)
- ISTEA = Intermodal Surface Transportation Efficiency Act
- JV = Joint Venture - Public/Private Partnership
- OTS = Office of Traffic Safety
- SS = Self Supporting
- TA = Transportation Authority
- TDA = Transportation Development Act

Wilbur Smith Associates; February 1995



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
Mello-Roos Community Facilities District Act of 1982	City of SF	State authorizes cities to issue special tax bonds for a community facilities district, if approved by 2/3 vote of the electorate. District can finance construction, operation and maintenance of recreation facilities.						
SF County Transportation Authority (SFCTA) Proposition B 1/2 cent sales tax	City of SF		Must be included in SFCTA Strategic Plan.	\$2.25 million for SF bicycle projects per MOU with DPW	None	03/15 for annual funding cycle Continuous for "project" category	Apply directly; SFCTA approval required.	Carmen Clark, SFCTA
SF General Fund	City of SF						Apply directly; Board of Supervisors & Mayor approval required.	John Newlin, SF DPT



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
SF Open Space Fund	City of SF	Open space projects	Must be included in Recreation & Open Space Element of SF Master Plan & Recreation & Park 5 Yr. Plan.			09/01	Apply directly; SF Open Space Advisory Committee	Deborah Learner, SF Recreation & Park Dept.
AB434 - County Program Manager's Fund	Regional - Bay Area Air Quality Management District - BAAQMD\$4 surcharge on motor vehicle registration.	Bicycle projects that reduce air pollution quality under 3 of 7 categories: Improve bicycle access & facilities; improve arterials to encourage bicycling; & improve access to rail & ferries		\$6 million in Bay Area (40 % of total), of which SF receives approximately \$600,000.		03/01	Apply through SFCTA; BAAQMD approval required.	Carmen Clark, SFCTA
AB434 - Regional	Same as above	Same as above		\$9 million (60 % of total) in Bay Area.	Ten percent of total funds available - \$900,000	07/14	Apply directly; BAAQMD approval required.	Michael Murphy, BAAQMD



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
CA Bikeways Act - Bike Lane Account (BLA)	State: State Highway Account. Funded by gasoline taxes.	Specifically for development of bicycle facilities	Requires 10% local match & a MTC & state approved bicycle plan not over 2 yrs. old.	\$360,000 statewide	\$90,000	12/01	Caltrans Office of Local Programs & Bicycle Facilities	Mel Aros, Caltrans, Office of Local Programs & Bicycle Facilities
CA Flexible Congestion Relief (FCR)	State: 9 cent CA gas tax	Same as ISTEA. Bicycle projects are eligible, but uncommon. Most funded projects are major hwy. projects.	Must be included in STIP & CMP, & must relieve hwy. congestion.	\$45 million in Bay Area for <u>2-yr. programming</u>		06/01 of <u>odd-numbered yrs.</u> ; next cycle is for FY 2001-2003	Apply through SFCTA; MTC & CTC approval required.	Doug Kimsey, MTC
Environmental Enhancement & Mitigation (EEM) - Prop. 111/AB471	State	Roadside recreation facilities including trails are eligible.	Must be included in STIP & must mitigate the environmental impact of modified or new public transportation facilities. No funds may be used for planning.	\$10 million statewide, of which 40 % is allocated to northern Counties.	\$500,000-exceptions made for merit	11/01	Apply directly; CA Resources Agency & CTC approval required	Bill Borden, State of CA Resources Agency



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
Habitat Conservation Fund (Wildlife Protection Act of 1990 - Prop. 117)	State	Trails in urban areas are an eligible category. Twenty percent of funds may be used for planning.	Requires 50% local match.	\$500,000 for urban trails		03/01/94, 03/01/96, 03/01/97 - each category is funded 2 yrs. out of 3 in the 7-yr. appropriation	CA Dept. of Parks & Recreation	Project Officer, CA Dept. of Parks & Recreation, Local Assistance Section
Land & Water Conservation Fund (LWCF) - Land & Water Conservation Fund Act of 1965	State	Recreational development. Local agencies can receive 40 % of the funds received by the state. Criteria include bicycle projects in high population areas, such as urban trails.	Requires 50% local match (cash or in kind).	\$1-\$2 million statewide of which 40 % is allocated to northern CA.	\$10,000-\$250,000 has been granted	12/01 Continues until 2015	CA Dept. of Parks & Recreation	Project Officer, Land & Water Conservation Fund, CA Dept. of Parks & Recreation, Local Assistance Section



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
Petroleum Violation Escrow Account	State: Money from petroleum company fines	Restoration projects that reduce dependence on petroleum products. Bicycle projects such as bicycle path reconstruction and bike lane resurfacing and restriping have been funded.		\$17 million			Apply directly; CA legislative approval required.	
State Coastal Conservancy (SCC) Shoreline Access Grants	State	Shoreline access. Has focused on SF Bay shoreline in recent yrs. Includes recreational trails	Requires local matching funds.	Variable		Continuous		Joan Cardellino, State Coastal Conservancy
Three Percent Toll Bridge Reserve - Regional Measure One	State: 3% of 1989 Bay Area bridge toll increase to \$1	Bicycle facilities; mass transit, including ferries. Funds may be used for planning.	Must help relieve congestion on Caltrans Bay Area toll bridges.	\$1.4 million in Bay Area.		05/01	Apply directly; MTC approval required.	Doug Kimsey, MTC



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
Transportation Development Act Article 3 (TDA)	State: 2% of the 1/4 % CA sales tax	Construction & maintenance of bicycle & ped. facilities, including parking; safety & education (up to 5 % of TDA funds); & bicycle plans. Projects that serve activity centers are viewed favorably.	Cannot be used to fully fund the salary of any one person	Approximately \$400,000 for SF bicycle & ped. projects.		01/01	Apply directly; MTC approval required.	Doug Kimsey, MTC
Dept. of Commerce Economic Development Adm. Public Works Grants (PW) & Public Works Impact Programs (PWIP)	U.S.	Assistance for communities that provide jobs for the un- or under-employed in redevelopment areas.						
FTA Section 3 Mass Transit Capital Grants	U.S.	Projects providing transit station access, such as bicycle parking & facilities are eligible.	Must be included in RTIP. Requires 10% local match, public hearings & environmental assessments.			09/01	Apply through FTA Regional Office; SFCTA & MTC approval required	Elisa Arias, Caltrans
FTA Section 9 Mass Transit Formula Grants	U.S.	Same as above	Same as above			09/01	Same as above	



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
ISTEA: Bridge Repair & Replacement Program	U.S.	Bikeways are eligible when they exist or will exist on either side of the bridge & where safety permits. Caltrans prioritizes projects by lowest FHWA deficiency rating & 2 may be replaced or rehabilitated each yr.				10/01		Caltrans Division of Structures, Local Assistance & Programming Branch
ISTEA: Congestion Mitigation & Air Quality Improvement (CMAQ) - Section 1008	U.S.	Construction of bicycle & ped. facilities or bicycle safety programs, such as brochures, maps, public service announcements.	Must be mainly for transportation rather than recreation & included in TIP. Requires 20 % local or state match.	\$7 million in Bay Area. SF may not be eligible due to attainment of required air quality standards			Apply through SFCTA; MTC approval required.	

Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
ISTEA: Federal Transit Funding (Title III, Section 25)	U.S.	Projects that improve bicycle & ped. access to transit, provide shelters & parking facilities for bicycles at transit facilities, or install racks or other equipment for transporting bicycles on transit vehicles.						
ISTEA: National Highway System (NHS) Section 1006	U.S.	Bicycle & ped. facilities near any non-interstate National Highway System roadway	Must be mainly for transportation rather than recreation & included in MTC's overall plan. Requires 20% local or state match.					



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
ISTEA: National Recreational Trails Fund Act (NRTFA) - Section 1302	U.S.	Development & maintenance of recreational trails to benefit bicycles, peds. & other non-motorized users.	Must be included in Statewide Comprehensive Outdoor recreation Plan (SCORP). Requires some state match after 3 yrs. from off-hwy. recreational vehicle fuel tax.	\$250,000 statewide		10/01		CA Dept. of Parks & Recreation, Local Services Section
ISTEA: Scenic Byways Program - Section 1047	U.S.	Construction of bicycle & ped. access facilities & safety improvements along hwys. Designated scenic byways and partnership projects get highest priority.	Requires 20% local or state match.					Caltrans, District 4, Regional Planning Branch



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
ISTEA: Surface Transportation Program (STP) Hazard Elimination Safety (HES)	U.S.	Projects in 1 of 2 categories ("Safety Index" & "Work-Type" improvements) that satisfy a safety need & correct the safety problem, including signs, lighting, barriers & guard-rails. Locations that have a high documented accident history score well.	Requires 0 or 10 % local match, depending on project type.	Approximately \$30 million allocated every <u>2</u> yrs.		10/01	Apply directly; Caltrans & FHWA approval required.	Al Raymond
ISTEA: Surface Transportation Program (STP) Section 1007 - Local guaranteed funds	U.S.	Construction of bicycle & ped. facilities or bicycle safety programs (such as brochures, maps, public service announcements)	Must be mainly for transportation rather than recreation & included in TIP. Requires 20% local or state match.	\$13 million for STP programs in Bay Area.			Apply through SFCTA; MTC approval required	
ISTEA: Surface Transportation Program (STP) Section 1007 - Regional funds	U.S.	Same as above	Same as above	Same as above			Apply through SFCTA; MTC approval required.	



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
ISTEA: Surface Transportation Program (STP) Section 1007 - Transportation Enhancement Activity (TEA)	U.S.: Approximately 10 % of the state's STP funds	Projects that are included in 2 out of the 10 TEAs: provision of facilities for bicyclists & peds.; & preservation of abandoned railway corridors.	Requires 20% non-federal match for bicycle & ped. projects. Must be included in TIP.		\$1 million	06/15/95 Must be re-programmed in 1997	Apply through SFCTA; MTC & CTC approval required.	David Murray, MTC
National Highway Safety Act (Section 402) - (Title II, Section 2002) Traffic Safe Cities - State & Community Traffic Safety Programs	U.S.	Identification & alleviation of traffic safety problems. Includes traffic records systems & accident studies to determine what improvements are needed Bicycle projects include development & implementation of public awareness & local safety education	Must eliminate current deficiencies or expand existing programs. Cannot replace existing programs or be used for construction, maintenance, research or rehabilitation.		None	04/30	Apply directly; CA Office of Traffic Safety (OTS)	William Jacobs, OTS



Table 4-5
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TRADITIONAL FUNDING SOURCES FOR BICYCLE PROJECTS AND PROGRAMS
San Francisco Bicycle Plan

Funding Program	Source	Use of Funds	Restrictions, Including Local Matching Funds	Max. \$ for Entire Program	Max. \$ per Project	Applications Due Date	Program Management/ Application/ Approval	Contact
Surplus Real Estate Program	U.S.	May be used for recreation, including bikeways & walkways						GSA, Office of Real Estate Sales

- Notes:
- 1) Funding Programs are first sorted by Source (City of SF, Regional, State, and U.S.) and then by Funding Program within each Source category.
 - 2) All funding cycles and funding amounts are annual, unless stated otherwise. If a year is listed in the Application Due Date column, that is the next year that an application may be filed.
 - 3) No local matching funds are required unless stated.
 - 4) Maximum \$ for Entire program column represents the amount funded in recent years.
 - 5) If the day of month of an application due date is not know, the first of the month has been entered in the table.

- **Bay Area Air Quality Management District (AB434)** - Bicycle lockers for both of two funding cycles.
- **Intermodal Surface Transportation Efficiency Act (ISTEA)** - Surface Transportation Program (STP): Lake Merced Boulevard median relocation and curb lane widening.
- **Office of Traffic Safety (OTS)** - Registration and travel expenses for two bicycle facilities planning courses.
- **Proposition 116 Rail Bonds** - Curb lane widening in various locations; Valencia Street median removal and curb lane widening; Commute route signage.⁽¹⁾
- **San Francisco County Transportation Authority Proposition B One-Half Cent Sales Tax** - Bicycle Plan and Spot Improvement Program.
- **Transportation Development Act (TDA Article 3)** - Various projects.

However, the continuance of many of these funding sources is not guaranteed, and may actually be in jeopardy due to recent political changes. Therefore, it is recommended that as much funding as possible be applied for as soon as possible.

NON-TRADITIONAL FUNDING SOURCES

Introduction

The purpose of this section is to summarize a variety of non-traditional funding sources that might be available for the long term implementation of project and program recommendations contained in the San Francisco Bicycle Plan. This element of the plan addresses potential grant and foundation opportunities, funding approaches used by several large employers, potential development/redevelopment recommendations, the development of alliances with other organizations and agencies with related bicycle promotion interests, and recommended approaches to more effectively using existing public and private funding available for bicycle related enhancement and maintenance efforts. It should be noted that acquiring additional revenues for the San Francisco Bike Program can only be used effectively if there are adequate staff resources to manage the fund.

It should be noted at the outset that a wide spectrum of traditional funding sources is available for bicycle programs and projects. Following the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, several new funding opportunities became available for bicycle projects and programs. The opportunities to develop regional funding requests that included a greater emphasis on air quality, congestion mitigation, and balanced transportation systems allowed bicycle programs to be evaluated routinely along with highway and transit requests. These Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) funds were further expanded via the federal government's annual consideration of worthy demonstration

⁽¹⁾ Note, this funding source is no longer available.

projects. In addition, the State of California passed the California Bikeways Act several years ago, establishing the Bicycle Lane Account. Coupled with other available public monies including the Transit Development Activities Article 3 program and the Flexible Congestion Relief funds, a variety of public grant sources are available to San Francisco's bike program. However, each of these traditional sources requires the development of grant applications, inclusion in the regional and state transportation improvement programs (RTIP and TIP) and the development of a long range bike plan. It is assumed, at this writing, that the 1997 re-authorization of ISTEA will continue the majority of these programs.

To date San Francisco has not been able to take full advantage of many of the traditional funding sources available. Unlike other agencies that are currently using ISTEA sponsored funding for a variety of efforts, including staff time (e.g. New York City), San Francisco has focused primarily upon State funding. Within the grant writing arena, the Bicycle Coordinator has focused his efforts on applying for funding from the following sources: TDA Article 3, Bay Area Air Quality Management District AB434 Clean Air fund, State Proposition 116, ISTEA-STP, and San Francisco Transportation Authority sales tax. Despite his limited time for grant application preparation, he has been successful in obtaining funds from all sources that he applied for. It is evident that staff resources are not sufficient to fully take advantage of traditional grant opportunities or the development of potential demonstration programs, much less the allocation of staff time to non-traditional approaches. Although the completion of the San Francisco Bicycle Plan will aid in the development of specific program and project recommendations, the need for additional personnel dedicated to expanding the revenue base of the program is paramount to the implementation of the Plan. As stated previously, this section of the plan will present the range of non-traditional approaches. Again, these opportunities can only be realized if staff, volunteer or professional services are directed toward them.

Grant and Foundation Opportunities

Private foundations provide excellent opportunities for funding specific capital projects or single event programs. To qualify for these types of funds, the Bicycle Advisory Committee, or an established non-profit group acting in their behalf, must exist. (See more information on this point later in this section). It also might be possible to work with existing non-profit organizations such as the Friends of Recreation and Parks. According to the 1994 "*Foundation Directory*", there are over 650 foundations within the State of California, many of them located in the Bay Area. The *Directory* only includes those organizations which held assets of \$2 million or more, or gave \$200,000 or more in grant awards in the previous year. In general, private foundations are initially established for specific purposes, i.e. children and youth needs, promotion of certain professional objectives, educational opportunities, the arts, community development, etc. There are four types of foundations located in the Bay Area:

- ▶ Independent Foundations
- ▶ Company-Sponsored Foundations
- ▶ Operating Foundations
- ▶ Community Foundations

In general, private foundations prefer to find programs that are special in nature, such as conferences or children's education events, rather than programs viewed as city responsibilities such as roadways, shipping, etc.

Independent Foundations - Independent foundations are private foundations with the primary function of awarding grants. The assets of most independent foundations come from the gift of a single person or family. Grant award decisions are usually made by the donor or family members, by an independent board of directors or trustees, or by a bank or trust officer acting on the owner's behalf. Most independent foundations (70 percent) limit their grants to the local area. In general, independent foundations limit their awards to specifically stated areas such as social, educational, religious or other charitable activities.

Company-Sponsored Foundations - These foundations are privately established with funds from a particular profit-making company or corporation. Although usually funded on very broad basis, these foundations often reflect the business interests of the company. In general, company-sponsored foundations are legally independent grant-making organizations with close ties to the corporation providing the funds. Funding tends to be in fields related to the corporate activities or in communities where the corporation operates. This type of foundation generally awards more grants, but usually in a smaller amount than independent foundations. Award decisions are usually made by a board of directors often composed of corporate officials, but may include individuals with no corporate affiliation.

Operating Foundations - The primary purpose of these organizations is to provide operating revenues to specific services. In general, operating foundations provide resources in the areas of research and services. In researching the availability of funds for bicycle education, construction, safety programs, or path/trail maintenance, no applicable operating foundations were reported either in the State of California or nationally.

Community Foundations - A community foundation is similar to a private foundation, however its funds are derived from many donors rather than a single source, as is usually the case with private foundations. As a publicly sponsored organization, a community foundation usually makes grants for social, educational, or other charitable purposes in specific community or regional areas. Grant award decisions are usually made by a board of directors representing the diversity of the community.

Types of Available Funding and Recommended Foundations

Following a review of the California foundations contained in *The Foundation Directory, 1994*, a list of potential contributors to the San Francisco bike program was developed. The following list of recommended foundations would be good candidates to fund the proposed Bicycle Safety Education Plan, the Motorist/Cyclists Program, and the Children's Program of the Bicycle Safety Education Plan. The costs of these efforts are estimated at approximately \$40,000. These individual costs, \$40,000, easily fall within the range of grants offered by the following organizations. In addition, it might be possible to combine these potential grant revenues with donations from an event sponsor, such as Nike or The Gap.

Bank of America Foundation - San Francisco, California - This company-sponsored foundation was established to provide funds to private, non-profit, tax exempt organizations providing services to communities locally, nationally and internationally in areas where the company operates. Support is provided in health, human resources, community and economic development. Support is also offered for special programs developed by the foundation to use its resources most effectively. Average size of grants is approximately

\$20,000, although the awards in 1993 ranged from \$1.3 million to \$250. The fund awarded approximately \$7.0 million in grants in the same year. In general, this foundation will not fund grants to individuals, fundraising events, research, conferences, publications, operating support or athletic events. This fund would be a potential candidate for a bicycle safety program.

Bechtel Foundation - San Francisco, California - The Bechtel Foundation provides grants for higher education and community funds, and to organizations related to some aspect of the engineering business and construction. It also supports cultural programs, public interest, health organizations, and social services. The total grant awards equaled approximately \$1.7 million, with a range of awards between a high of \$275,000 and a low of \$1,000. The fund provides no support for individuals, religious organizations or endowments. This foundation would be an excellent source for seed money to support a special event, such as the recently proposed Pro-Bike/Pro-Walk Conference or a bicycle safety program. The Pro-Bike/Pro-Walk Conference is a national event that brings together planning specialists interested in promoting increased activities in these areas. Such a conference could take place in San Francisco as early as 1998.

The Morris Stulfart Foundation - San Francisco, California - This independent fund was established and specifically designed to aid and assist needy and deserving children. It provides funds for youth programs, including social service, educational, health, cultural and recreational programs. The program provides support for operating budgets, building funds, equipment, matching funds, renovation projects, research, special projects, and seed money. The fund provided approximately \$1,000,000 in grant funds last year, with individual grants ranging to a high of \$50,000. The foundation's funding is limited to the San Francisco area. In general, the fund will not support sectarian religious projects, on-going support for private schools, individuals, emergency planning, annual funds, workshops, or conferences. This fund would be an excellent candidate for specific bike capital improvements, bike safety programs, seed money for special events, and perhaps for additional staff or grant writers for the bike program. To maximize success, grant applications should have a youth oriented approach.

S.H. Cowell Foundation - San Francisco, California - This fund supports educational programs, pre-school and primary educational programs, community organizations, employment training programs, environmental programs, youth organizations and affordable housing programs. The type of support available includes seed money, building funds, equipment, land acquisition, matching funds, capital campaigns, and special projects. The independent fund distributed \$6.0 million in 1993, with grants ranging from \$320,000 to \$20,000. This program is limited to Northern California. Generally, the fund will not support individuals, religious groups, operating budgets, endowments, media programs, continuing support, routine administration, workshops, conferences, medical research, deficit financing, or publications. This foundation might potentially support a one-time grant for grant writers, bike safety programs, a free helmets to children program, matching funds or total funding for specific bike capital projects, right of way acquisition for a new bike trail linked to environmental issues, and, perhaps, seed money for the development of the Pro-Bike/Pro-Walk Conference.

The San Francisco Foundation - San Francisco, California - This community foundation limits its funding to the Bay Area and includes funding for community development, urban affairs, health, arts, humanities, education, cancer, AIDS, environmental issues, child welfare, public policy and special needs planning. The program delivered \$25.5 million in grants for 1993. The average grant size was approximately \$50,000. This community foundation has in the past supported operating budgets, seed money, loans, technical assistance, and special projects. The foundation generally will not support annual campaigns, deficit financing, general fundraising campaigns, matching gifts, scholarships, or endowment funds. This fund would be an excellent source of potential revenue for most of the proposed San Francisco Bike Plan recommendations, including capital projects, initiation of new campaigns, educational programs and special events. With the exception of the development of a fund-raising campaign for bike improvements, it has the widest range of potential application and is the largest single foundation grantor in the Bay Area.

Swig Foundation - San Francisco, California - This independent foundation was established primarily to support the arts, cultural programs, education, community welfare, medical programs, and Israel. The fund supported \$1.3 million in grants in 1993. The fund is principally limited to San Francisco and in general does not support individuals, conferences, seminars or workshops. The average award last year was approximately \$50,000. This foundation could be a potential source of revenue for safety and education programs, support for specific capital projects (particularly those including art or cultural components), and seed money for new programs.

National Energy Foundation - Washington, D.C. - In addition to the previously described local funding foundations, the National Energy Foundation is also a source of revenue. This fund was established in cooperation with the nation's leading fuel companies in an effort to develop new and more energy conscious alternatives to fossil fuels. Annual funding levels exceed \$1 million. In general this foundation supports transportation improvements in alternative fuels technology, telecommuting, and air quality improvements and is an excellent source of potential funding for unique bicycle programs.

Approach to Developing Foundation Grant Requests

Foundation funds are generally limited to non-profit organizations that qualify as 501-C3 tax exempt groups. This allows the fund amount to be considered a "charitable donation" under the Federal tax code. Existing organizations that would qualify under this classification with related bicycle interests would include the San Francisco Bicycle Coalition, and possibly the Friends of Recreation & Parks. Most of the foundations described previously require an initial letter of intent/interest from prospective grantees. In general, the letters are limited to three pages and follow-up information is only requested for those letters considered the most promising.

Given adequate staff support, or through the volunteer efforts of the San Francisco Bicycle Coalition, it is recommended that a variety of three page proposals be prepared for these San Francisco based foundations. For those organizations that provide funds primarily for youth related activities, the letters of intent should be tailored to the children's bicycle safety program and perhaps a free children's helmet campaign for low income areas of the City. For those foundations focused upon the arts, recommendations should also include art related elements such as bike path

restoration coupled with pedestrian improvements (benches, etc.) and art features, e.g. "*A Linear, Environmentally Conscious, Work of Art*".

Development of Mutual Interest Alliances

Although not a requirement for the development of successful foundation grant applications, the development of mutual interest alliances is a key component of the remaining non-traditional funding recommendations prepared for the San Francisco Bicycle Plan. The main reason for this recommendation is the strategic advantage it presents to bicycle advocates. To date, the proponents of an aggressive bicycle development and implementation strategy have not been a group large or strong enough to sufficiently influence City policy makers to either expand the staff of the bicycle program or develop more aggressive strategies involving additional City agencies.

Another approach, which has been successfully implemented in other cities, is the melding of support from other citizen based organizations, other public agencies or private sector interests with bicycle interests. In this manner, more weight is placed behind certain recommendations. It is recommended that the City pursue key alliances to enhance the immediate opportunities available for non-traditional funding. These potential alliances include:

San Francisco Convention and Visitors Bureau (SFCVB) - Because this association is focused upon the expansion of visitor and tourist revenues for the City of San Francisco, there are two major areas of overlap with the Bicycle Plan recommendations. First, the Bicycle Coordinator and the San Francisco Bicycle Coalition are interested in having the 1998 or 2000 Pro-Bike/Pro-Walk Conference in San Francisco. However, the major impediment to moving this idea forward is the availability of a meeting planner's time to help coordinate the event. By working with the SFCVB, the Bicycle Coalition could possibly obtain their support for the development of the conference, selection of a site, and the SFCVB could also be a potential contributor to the conference.

Another area of potential overlap for SFCVB could be the development of a map, designed for tourists and visitors and highlighting scenic bike routes, perhaps in tandem with recommended walking and running routes. Such a map could also show the location of bike rental facilities and secure public bike parking facilities, and could possibly be sponsored by one or several bike/walk/run commercial interests, showing their retail locations on the map. For example, the opening of the new Nike Town in downtown San Francisco might be an impetus to the development of such a map with a single sponsor. The map could be marketed with the help of SFCVB and Nike to retail outlets, hotels, book and travel stores. If designed in a colorful, readable format, folding to the size of a standard business envelope, the map could also be laminated to retain its form over a sustained period of time. Similar street maps of San Francisco retail for approximately \$7.00. Profits from such a map could then be used to support bicycle education and safety programs and perhaps add additional staff to the Bicycle Coordinator's Office.

Selected Corporate Sponsors - In other areas of the country, bike interests have developed long term relationships with selected corporate sponsors. In exchange for exclusive advertising rights to public announcements, T-shirts, signage and event logos, selected sponsors will support the bicycle event or program. Often these relationships develop informally, but are supported over the years as the popularity of the event/program grows.

For example, Cycle Oregon (described in the next section) relies exclusively upon Nike as their corporate sponsor for this very popular annual event. In exchange for the rights described above, Nike provides all apparel provided to the 2,000 annual cyclist participants, in addition to subsidizing promotional costs of the event. Within the Bay Area, numerous opportunities exist to approach corporate or regional headquarters as potential sponsors. Recommendations for the San Francisco program might include the Levi Strauss Company, Nike, Gap, and, the Bank of America.

National Park System/Golden Gate National Recreation Area - Many of the concepts recommended in this report would be enhanced if coordinated with the representatives of the park system. For example, the City of San Francisco could help develop and sponsor a bike tour that linked the City with several major park locations such as the Point Reyes National Seashore, Redwoods National Park or Yosemite National Park. A very popular bike tour in Missouri, called Camping Across Missouri Parks, links major cities in that state with the national park system.

Fund Raising Through Promotional Events and Sales

Many states rely upon cycling events to promote bike objectives within the community and to raise revenues for future bicycle planning efforts. One of the major national examples of this strategy is the annual Cycle Oregon event.

Cycle Oregon - This event is a seven-day bike tour across a selected area of Oregon. Each September, this event provides participants with a full support system for the duration of the week. In exchange for the current application fee of \$400, participants receive all meals, campsite facilities, rolling medical support, rolling mechanical support, two rest stop locations with refreshments each day, hot water showers, and one set of clothes.

The event allows only 2,000 participants. This year's Cycle Oregon sold out in seven days. One of the key strategies to the continuing popularity of the event, is the development of a new route each year. With an emphasis on rural and scenic vistas, the revised route each year seems to attract both new and previous participants. After covering the costs of operations, the event provides approximately \$100,000 to local jurisdictions for bike planning and bike capital projects. In essence, the program is self-sustaining, in that many of the new bike routes, paths, lanes and improved bridge access approaches then become future selected locations for new Cycle Oregon routes.

The event's support system includes two full time staff members, the addition of two seasonal staff employees between spring and fall, two summer intern positions, and the addition of 2-3 additional staff members during the ride. Additional financial support is provided to the event through the donations of all trucking services for the event (six semi-trailer trucks for eight days), Subaru's donation of six staff cars for the duration of the event for the full time staff members, Nike's donation of all free apparel, and free print and publication services. In exchange for these donations, the contributor's receive exclusive advertising rights for the event, the event's promotion, signage, clothing and radio/TV coverage.

Currently the Bay Area has one major bike tour, the *Greenbelt Alliance Tour Around the Bay*. Although a very popular event, the tour is on a much smaller scale, does not alter its route annually, and does not contribute excess revenues to future bike planning efforts.

Pro-Bike/Pro-Walk Conference - One of the approaches used by the City of Portland and the City of Seattle in applying to the Bicycle Federation to hold the conference in their city was the scheduling of the conference in conjunction with a major bike tour. This attracted a larger number of potential convention attendees and helped the city be selected as the conference site. This conference attracts bike planners, advocates, corporate sponsors, and cyclist enthusiasts from across the country. It is an excellent opportunity for the development of an alliance with the San Francisco Convention and Visitors Bureau and the development of corporate sponsorships for the event.

Funding Opportunities From Requirements on Large Employers/Developers/Special Events

Four years ago, the San Francisco Transportation Management Association (TMA) was established to provide alternatives to the single occupant car for San Francisco commuters. However, the work done by the management association focuses primarily upon transit and ridesharing opportunities, and less on bike opportunities. In addition, bike facilities are rarely required as part of the City's review process. In spite of this situation, there are two San Francisco employers currently pursuing a bike program. This section briefly outlines these programs and lists suggestions for future consideration in the area of new development/redevelopment and special event requirements.

Existing Employer Programs

University of California, San Francisco (UCSF) - The University charges a parking fee for employees and students working and studying on campus. A portion of this parking fee is annually allocated to the bike program. With funds from this account, capital improvements have been initiated including the installation of lockers and racks.

Future Development and Employer Opportunities - The key to implementing a bicycle support program for new development or redeveloped sites is either to require the bike improvements as part of the City's review process, or to provide financial incentives to encourage their installation. Specific recommendations include:

1. Require building management/leasing companies to provide secure bicycle parking facilities as a proportion of total building square footage. Such a requirement could be implemented for all new construction within the City, as well as for redeveloped buildings. A minimum threshold for building size should be developed as part of this recommendation. This recommendation should be developed and refined in cooperation with the San Francisco Bicycle Advisory Committee. It is possible that it could also be considered by voter referendum.
2. Require that businesses provide transportation allowances for employees who bike or walk to work. This allowance should equal the current subsidy that employees can receive for transit passes.
3. Initiate a tax incentive structure for those employers that provide facilities for employees who bike to work. Facilities would include lockers, showers, and/or secure bike storage sites.

4. For those developers required to contribute to infrastructure improvements as part of their building permit or zoning change, allocate a portion of this revenue to a Bike Facility Fund. Although specific bike related roadway infrastructure may not be required immediately adjacent to the new development, this fund could provide an overall bike path/lane system that could be accessed by employees of the newly developed site.

Special Events Coordination - Currently bike parking is not required for special events within the City. By requiring special event promoters to provide secure bike parking facilities, auto congestion would be reduced and access by alternative modes increased. In addition, this recommendation might encourage casual weekend and evening bike enthusiasts to consider commuting to work by bike.

Effective Use of Existing Public and Private Funding Sources

In addition to the recommendations described previously, several suggestions have been derived from research and interviews during the preparation of this task, to enhance coordination between on-going public/private programs and the objectives of the San Francisco Bicycle Plan. It should be noted that many of these areas are not only the responsibility of the Department of Parking and Traffic and would require inter-departmental coordination to implement. Among these areas of increased coordination are:

Utility Relocation Improvements/Requirements - Following the finalization of the San Francisco Bicycle Plan, recommendations regarding the improvement of street surfaces or the striping of future bike lanes should be coordinated with the local, private utility companies. In the State of Washington, utility companies have worked with local bike planners to coordinate their utility system maintenance program with specific bike lane striping projects.

National Office of Transportation Safety - Both the national and state offices of Traffic Safety have grant funding programs for bicycle safety. The National Transportation Safety Board provides educational funds to selected programs on a grant submittal basis. Last year the program funded grants primarily focusing on the areas of highway and air traffic safety. Although bike operations are not a large portion of the office's focus, there has been interest in maintaining and promoting children's helmet ordinances. This area may be an appropriate source of child safety education funds for the San Francisco Bicycle Plan recommendations.

Mandatory Bike Registration - Many cities require the mandatory registration of bicycles. In the State of California it is possible for local cities to require registration and utilize the State's ability to track bicycles between different cities. If a particular city makes registration mandatory, it is responsible for issuing registration stickers, maintaining the data base, and collecting registration fees. Currently the fees charged by the State are capped: \$6.00 for an initial registration and \$3.00 for renewal. To date, the City of Davis has developed the most successful bicycle registration program. The University of California at Davis requires that all bikes on campus be registered. The funds resulting from the sale of registration stickers are used to support the operations costs of the program. A total of 8,000 bikes are currently registered per year in Davis. It should be noted that opposition currently exists with regard to this program and its approval in San Francisco is not assured.

Buck-a-Bike Fee - It has been suggested that bikes sold in San Francisco have a \$1.00 fee attached to the sale. These fees could be used to help fund the bicycle program and its on-going costs.

San Francisco Street Resurfacing Program - With the passage of Proposition B in 1989, the voters of San Francisco approved over \$900 million in transportation improvements, to be implemented over 20 years. These sales tax revenues are allocated 60 percent to transit projects, 30 percent to roadway improvements, and 10 percent to paratransit, bike and pedestrian programs. Of the funds allocated to roadways, \$250 million has been set aside for street resurfacing. The Department of Public Works (DPW) is responsible for developing a recommended list of candidate streets eligible for resurfacing on an annual basis. Following the development of recommended bike lanes/routes within the City of San Francisco, the Bicycle Coordinator should work with DPW staff to insure that bike route streets receive priority for resurfacing.

Miscellaneous Recommendations

Lastly, the development of this task has uncovered several recommendations that fall into a miscellaneous category. Among the most promising are:

Adopt-A-Trail/Path Programs - Modeled upon the Southern California program of highway maintenance contributions, this program would post signs to indicate which individual or group has contributed to either the development, installation or maintenance of a particular bike facility. Although the density of San Francisco development may limit the construction of new paths, the maintenance of existing paths could be passed.

Memorial Funds - These programs are advertised as potential donor projects to be funded via on-going charitable contributions or funds left to a particular project through a will. Most memorial projects include the location of a memorial plaque at a location specific to the improvement or a scenic vista point.

Revenue Producing Operations - As part of the development of a trail or bike path, plans can specifically include the location of a revenue producing operation adjacent to the proposed improvement. For example, bicycle rental facilities, food and drink establishments, bike storage facilities and equipment centers, and/or equestrian centers, would be appropriate uses. The on-going lease revenues from these operations could then be used for trail/path maintenance.



5. RECOMMENDED DESIGN STANDARDS

This chapter presents guidelines for designing, striping, signing or otherwise designating bicycle facilities, intersections, or roadways to improve bicycle safety.

The design criteria of the *California Highway Design Manual* (HDM), and the *California Traffic Manual* are hereby incorporated by reference. This chapter presents guidelines for how to apply Caltrans' minimum design criteria for bike paths and bike lanes.

In addition, this chapter recommends design treatments for particularly difficult situations for bikes (such as at right-turn lanes and off-ramp right-turn merges with city streets). It also presents recommended signs or pavement legends that, although not contained in the *Traffic Manual*, will be essential for the complete and effective implementation of the bikeway network. Most of these installations (or variations) are being used in other cities in the U.S.

Bike Paths

The City has relied on the bike path design standards of the HDM, which call for a minimum 8-foot paved path and recommend 12 feet where pedestrians are expected. The default design practice in San Francisco in many cases is 8 feet, regardless of the expected or actual pedestrian use. Figures 5-1 through 5-5 present guidelines for paths of various design specifications. (All figures are presented at the end of this chapter.) These are intended as guidelines rather than hard and fast design standards. But, if followed they will increase the utility of the facility to all potential users.

Where short bike paths are recommended to connect two segments of a route, an 8-foot paved width is probably adequate. Of course, if such a bike path segment will essentially double as a sidewalk and have many pedestrians, 8 feet may not be adequate. Engineering judgement will need to be exercised on a case by case basis. Such short segments are generally less than 500 feet or so in length (see Figure 5-1).

An 8-foot cross section is also adequate for a bike path of any length where few or no pedestrians are expected. However, given the density of San Francisco, this situation is probably rare. Most bike paths will be essentially multi-use trails, and thus should be designed to more than minimum standards. The more pedestrians or non-bicycle users projected, the wider the path should be. For paths with low pedestrian volumes, (approximately 50-100 per peak hour) minimum paved width is recommended to be 10 feet and the minimum recommended cross section is depicted in Figure 5-2. For moderate pedestrian volumes (approximately 100-400 per peak hour), the recommended cross section is depicted in Figure 5-3 with a paved width of between 12 and 16 feet. For heavy pedestrian volumes (greater than approximately 400 per peak hour), two parallel facilities are recommended: one for faster traffic, such as bicycles and roller blades, and one for slower modes such as pedestrians, children on training wheels, etc. This is depicted in Figure 5-4.

Finally, in areas where automobiles can be prohibited, a road restricted to bicycle use would be an excellent way to provide mobility to bicycles and to safely separate the slower users. Such a facility would have the look and feel of a traditional road and could in fact serve as emergency vehicle or

maintenance vehicle access if needed. Examples of appropriate locations for a bikes-only road could be in the Presidio and in redevelopment areas, especially if reducing dependence on the automobile is to be encouraged.

One of the most dangerous conflict points along a two-way bike path is its intersection with cross streets. To increase motorists' awareness that bike traffic is crossing in both directions, the pavement for the bicycle's path across the intersection should be designed as an 8-foot band of distinctive color, as illustrated in Figure 5-6. This design is currently used in the City of Montreal, and the design specifications for the colored pavement surface are presented in Appendix D.

Bike Lanes

While the minimum bike lane width specified in the HDM is 4 feet (5 feet with parking), this minimum design standard should be reserved for situations that are not worst-case in terms of traffic volume and speed. On streets with over 500 vehicles per hour per lane (vphpl) and/or speeds of 35 mph or more, the goal should be bike lanes of 6 to 8 feet in width. The recommended bike lane width and travel lane widths for a given curb-to-curb width are presented in Table 5-1.

Class III Bike Routes and Wide Curb Lanes

By their very nature, wide curb lanes and Class III bike routes require no special markings. However, it is recommended that a pavement stencil, as illustrated as Item 10 in Figure 5-7, be used in the right-hand portion of the lane. This stencil should be supplemented with "Share the Road" signs (Item 2) for lane widths of 12 to 14 feet and with "Bikes Allowed Use of Full Lane" (Item 4) for lane widths of 11 feet or less. These signs are illustrated in Figure 5-7. The City may also wish to use these signs and stencil on roads which are not designated bikeways as bicyclists have the same rights on every road. It is not the intent that such signs be posted on every road. It is recommended that, in addition to designated bikeways, these signs and pavement stencils be used on roadways with heavy traffic volumes and narrow lanes i.e. more than 600 vphpl and curb lane widths of 14 feet or less (22 feet or less with parking).

The pavement stencil should be painted every 200 feet. Appendix D contains the design specifications used by the City of Denver, developer of this stencil.

Recommendations at Right-Turning Situations

Right-Turn-Only Lanes - Right-turn-only lanes present two difficulties to bicyclists:

- ▶ Through bicyclists are forced to weave across the right-turning motor-vehicle traffic; and
- ▶ Lane widths are often narrowed in order to accommodate a right-turn-only lane.

In order to mitigate these problems, the right-turning motorists need to be made aware of the presence of bicyclists, and bicyclists need to be made aware of the correct position to ride through the intersection. Three alternative signing and striping plans are presented in Figure 5-8, depending on the available lane widths. These plans recommend the use of sign R4-4 from the Manual on Uniform Traffic Control Devices (MUTCD) to warn right turning motorists of the bicycle weave.



Table 5-1

DESIGN GUIDELINES FOR STRIPING BIKE LANES ON SAN FRANCISCO STREETS

Curb-Curb Width	Parking Lane Width	Bike Lane Width *	Curb travel Lane Width	Inside Travel Lane Width	Inside Travel Lane Width	Curb Travel Lane Width	Bike Lane Width*	Parking Lane Width
44'9"	7	5.5	9'10.5"	-	-	9'10.5"	5.5	7
46	7	6	10	-	-	10	6	7
48	7	6	11	-	-	11	6	7
50	7	7	11	-	-	11	7	7
52	7	7	12	-	-	12	7	7
54	7	8	12	-	-	12	8	7
56	7	6	10	10	-	10	6	7
58	7	6	11	10	-	11	6	7
60	7	6.5	11	11	-	11	6.5	7
62	7	6.5	12	11	-	12	6.5	7
64	7	7	12	12	-	12	7	7
66	7	6	10	10	10	10	6	7
68	7	6	11	10	10	11	6	7
70	7	6	12	10	10	12	6	7
72	7	6	12	11	11	12	6	7
74	7	7	12	11	11	12	7	7
76	7	8	12	11	11	12	8	7
78	7	8	12	12	12	12	8	7

* For critical speeds greater than 35 mph, bike lanes should be minimum of 7 feet.

Wilbur Smith Associates; November 1994

Right-Turn Merge - Many right-turn lane junctions with City arterials have been designed to facilitate a high speed merge. Examples are freeway off-ramps merging with City streets (e.g. US 101 at Army Street) and free right-turn lanes from one arterial to another (e.g. the Oak Street merge between Stanyan and Shrader Streets). These high speeds are usually inappropriate for travel along the arterial, and expose bicyclists to unnecessary serious risk of injury. Recommended signing and striping plans are presented in Figures 5-9 and 5-10 for three situations:

- i. An off-ramp merge with an arterial;
- ii. An off-ramp with added lane junction with arterial - no bike lane; and
- iii. An off-ramp with added lane junction with arterial - with bike lane.

In addition, Item 9 in Figure 5-7 presents a sign to be used in the situation of an on-ramp diverging from an arterial, for example eastbound Army Street at southbound Bayshore Boulevard on-ramp or the southbound 101 on-ramp.

Transit Island - Bicyclists currently experience difficulty passing buses stopped to the right of transit islands. The minimum curb-to-curb width for such installations should be 14 feet, as illustrated in Figure 5-11.

Miscellaneous Signs

Figure 5-7 presents signs that are recommended for use in San Francisco even though they are not contained in the Traffic Manual. Item 3 presents a sign currently used in Santa Cruz County to warn all modes that traffic laws are strictly enforced. This sign is recommended in locations where compliance with traffic control devices has been exceptionally low. Items 6, 7 and 8 are recommended signs to be used in conjunction with Traffic Calming strategies; all are currently used by the City of Palo Alto.

Development/Redevelopment Areas

New developments and redevelopment projects offer an opportunity to make a truly bicycle friendly roadway network. Roadways within such areas should at a minimum conform to the design standards discussed above. All arterials should be designed with bike lanes. Preferably, on-street parking should be prohibited. The minimum bike lane width should be six feet. For example, Third Street through Mission Bay should have 6-foot-wide (minimum) bike lanes.

Residential streets should be designed with design speeds of less than 25 mph using traffic calming design features described in Chapter 6. Urban Design features should be incorporated which minimize the attractiveness of the automobile and support bicycling and walking.

Collectors should be designed again with a maximum speed of 25 mph. If projected traffic volumes are more than 4,000 vpd, then bike lanes should be included.

All new developments in the City should be connected to the recommended bicycle network.

Bike paths should be provided along places of scenic beauty, particularly along the waterfront and ocean. The Presidio has numerous possibilities to have bike-only roads. These would be compatible with the National Park character of the Presidio as bike and pedestrian modes are the most environmentally benign.

Intersection Control

For bicyclists, travel is generally easy once momentum has been gained. STOP signs require the bicyclist to come to a complete stop, and thus lose their momentum which they must then work to regain. On the recommended routes and roads that have a high degree of bicycle travel, STOP signs should be removed where they do not meet warrants, and cross traffic should be required to stop. For a more thorough discussion of traffic calming techniques, see Chapter 6.

Signal Timing

Signal timing has been used with great success for motorists in San Francisco to improve traffic flow and reduce delay. The same reasons that make it desirable for motorists—constant and efficient speeds—make it desirable for bicyclists. Where possible, the City should consider timing the signals along bike routes for bicycle speeds—approximately 12 to 15 miles per hour.

Minimum green times at actuated signals should take bicyclists into account. Bicyclists need more start-up time than motor vehicles. Actuated signals should be timed so that the minimum green time is at least 8 seconds where grades are flat. On routes with an upgrade, bicyclists need even more time. At intersections along major thoroughfares, particularly with widths of 75 feet or more, red clearance intervals should be provided to allow time for bicyclists to clear the intersection before cross-traffic is given a green indication. A recent research paper for the California Bicycle Advisory Committee provides additional discussion on the issue of signal timing for bicycles.⁽¹⁾

Vertical Step Height

When paved street surfaces are interspersed by manholes, drainage grates, the seam between asphalt roadways and the concrete gutter, or other obstacles, it is important that they be set flush with the paved roadway. According to Highway Design Manual Standards, when the step between the pavement and obstruction is greater than 3/4 of an inch perpendicular to travel, and 3/8 inch parallel to travel, it poses a threat to safe riding conditions for bicyclists. Ideally, whether perpendicular or parallel to travel, the allowable tolerance in roadway surface should be within 1/16 of an inch.

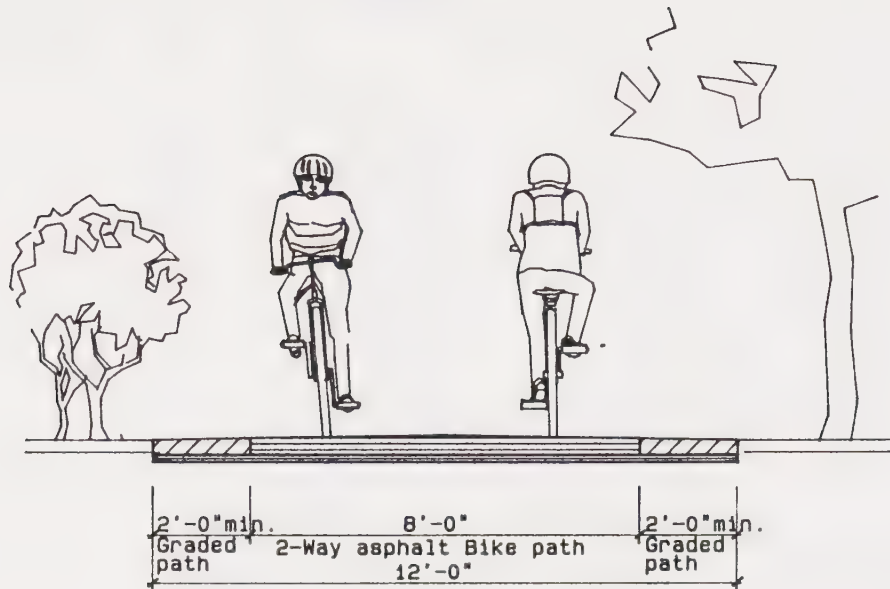
Miscellaneous Obstructions and Hazards

Manholes, drainage grates, and construction road plates also pose problems because of their slippery surfaces and/or grooves which can cause bicycles to slip or get caught, and thus fall over. Although they pose a greater danger to the beginner bicyclist, even the most advanced cyclist faces a risk when riding at night or in heavy traffic volumes which leave no choice but to ride over the obstacle. When possible, road construction plates and manhole covers should be treated with a non-skid surface, or ordered as such. The City of Toronto, Canada has experience with such treatments.

⁽¹⁾ *Signal Clearance Timing for Bicyclists*, Alan Wachtel, John Forester, Gary Foxen and David Pelz.

Drainage grates and railroad tracks present the possible danger of catching a wheel and throwing a bicyclist from their bicycle at worst, or causing expensive wheel damage at best. A discussion of methods for mitigating these risks is given in Chapter 8 under maintenance policies.

Speed bumps damage bicycles' wheels just as they are intended to damage cars at high speeds. Fortunately they are not allowed on City streets. Speed humps, which have a more gradual incline, are acceptable if designed correctly. A more thorough discussion of speed humps is provided in Chapter 6. Rumble strips are another common problem for bicyclists. As per the Traffic Manual, they should only be installed where other measures have proved ineffective. When raised ceramic markers are installed as rumble strips, they should not be installed clear to the edge of the travelled way. A clear space of 18 to 24 inches through which bikes may travel should be provided at the right-hand edge and in the center of the travel lane.



SHORT BIKE PATH SEGMENTS OR BIKE
PATHS WITH LITTLE OR NO PEDESTRIAN USE

WSA WILBUR SMITH ASSOCIATES

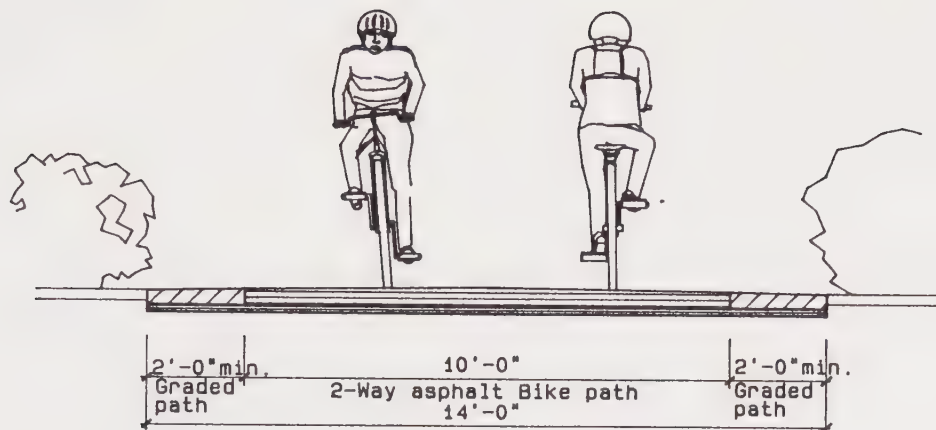
Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

SHORT BIKE PATH SEGMENTS LESS
THAN 500' OR BIKE PATHS WITH
LITTLE OR NO PEDESTRIAN USE

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-1



WSA WILBUR SMITH ASSOCIATES

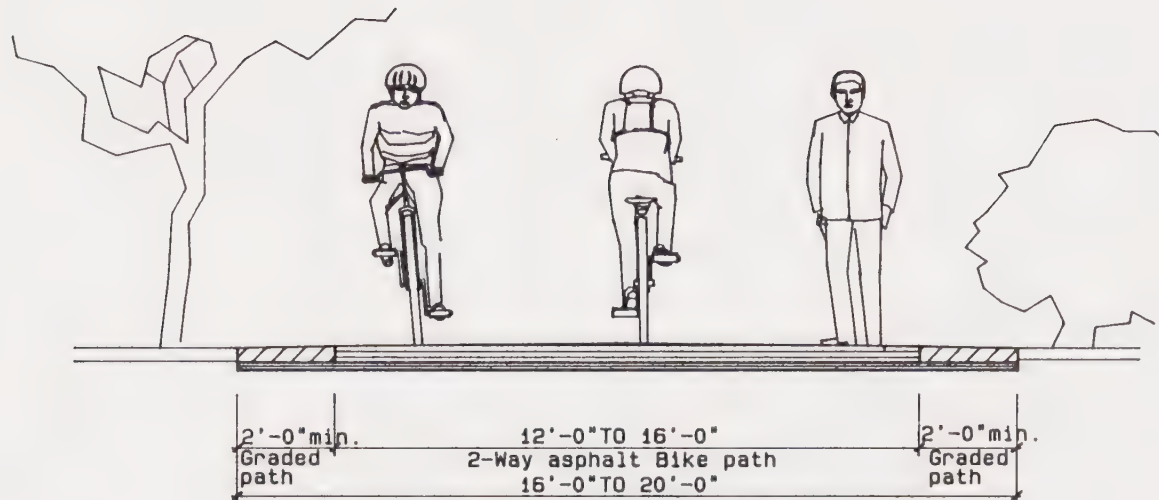
Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

BIKE PATH WITH LITTLE
OR NO PEDESTRIAN USE

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-2



MULTI-USE TRAIL-MODERATE
PEDESTRIAN VOLUMES

WSA WILBUR SMITH ASSOCIATES

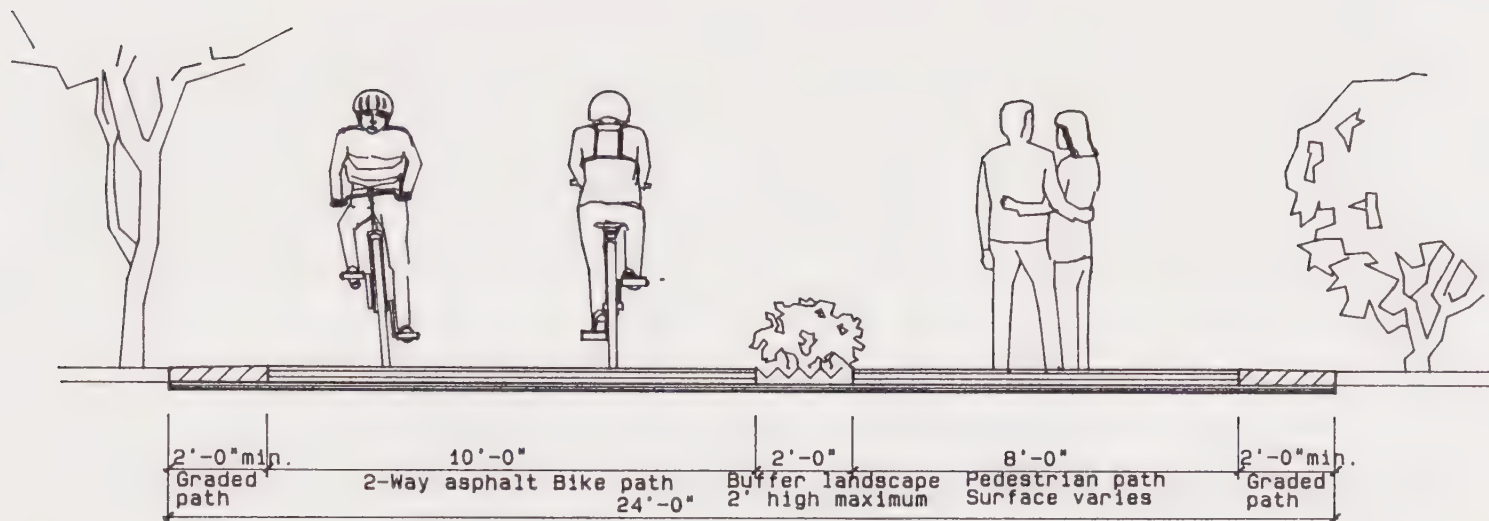
Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

MULTI-USE TRAIL-MODERATE
PEDESTRIAN VOLUMES

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-3



SEPARATE PATHS FOR BIKES AND PEDESTRIANS
- HEAVY PEDESTRIAN VOLUMES

WSA WILBUR SMITH ASSOCIATES

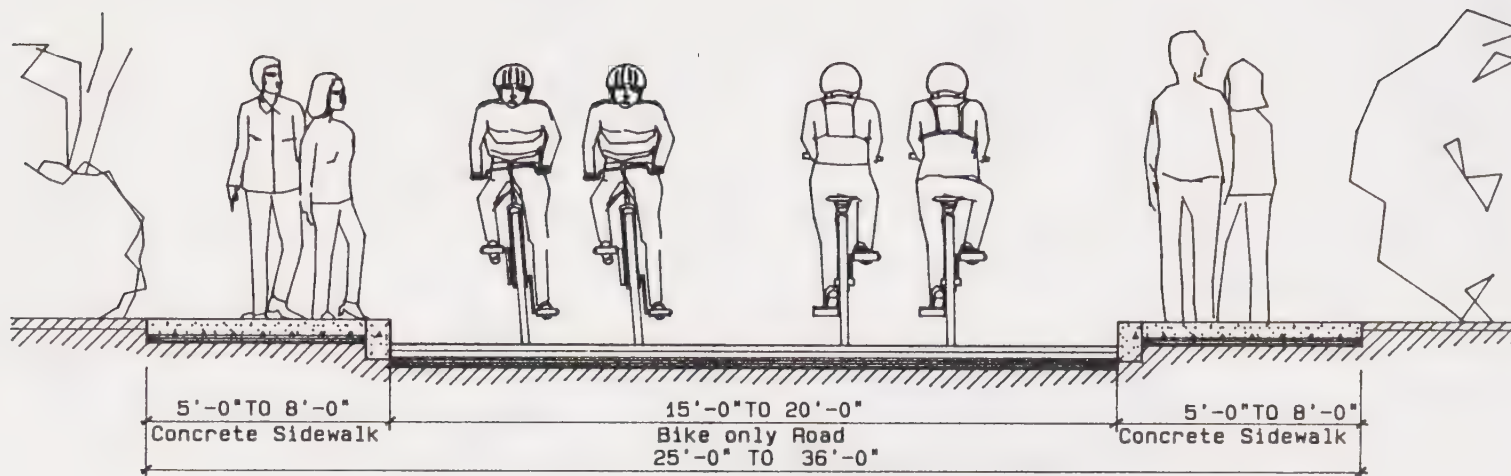
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San Francisco, Ca. 94133

SEPARATE PATHS FOR BIKES
AND PEDESTRIANS -HEAVY
PEDESTRIAN VOLUMES

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-4



BIKE ONLY ROAD FOR NEW DEVELOPMENT AND
REDEVELOPMENT AREAS WHEREVER POSSIBLE

WSA WILBUR SMITH ASSOCIATES

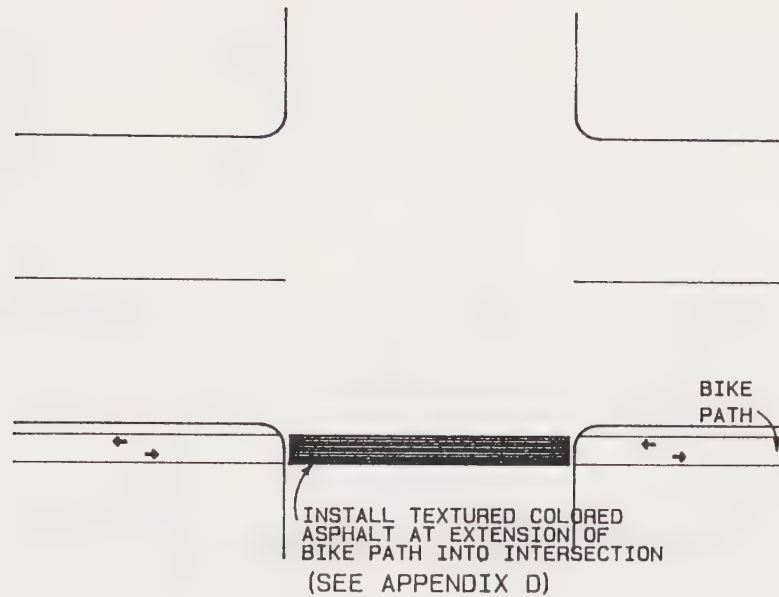
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San Francisco, Ca. 94133

BIKE ONLY ROAD FOR NEW
DEVELOPMENT AND
REDEVELOPMENT AREAS

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-5



WSA WILBUR SMITH ASSOCIATES

Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

RECOMMENDED TREATMENT AT
TWO WAY BIKE PATH
CROSSING OF INTERSECTION

SAN FRANCISCO
BICYCLE PLAN

FIGURE

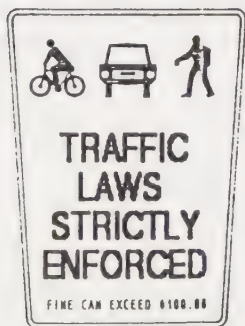
5-6



1. SIGN DETAIL
SS-1



2. SIGN DETAIL
SS-2



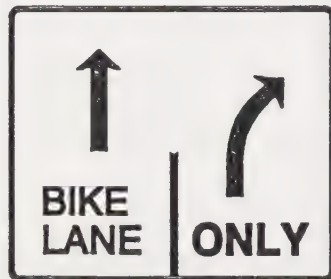
3. SIGN DETAIL
SS-3



4. SIGN DETAIL
SS-4



5. SIGN DETAIL
MUTCD R4-4



6. SIGN DETAIL
SS-5



7. SIGN DETAIL
SS-6



8. SIGN DETAIL
SS-7



9. SIGN DETAIL
SS-8



10. BICYCLE SYMBOL
PAVEMENT LEGEND
(SEE APPENDIX D)

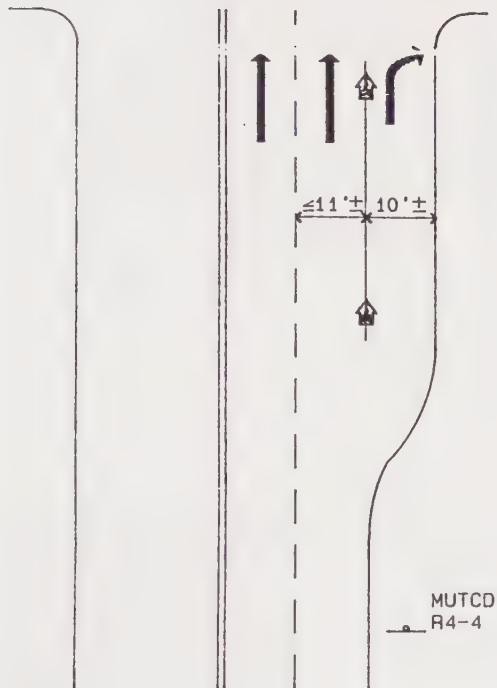


11. SIGN DETAIL
SS-9

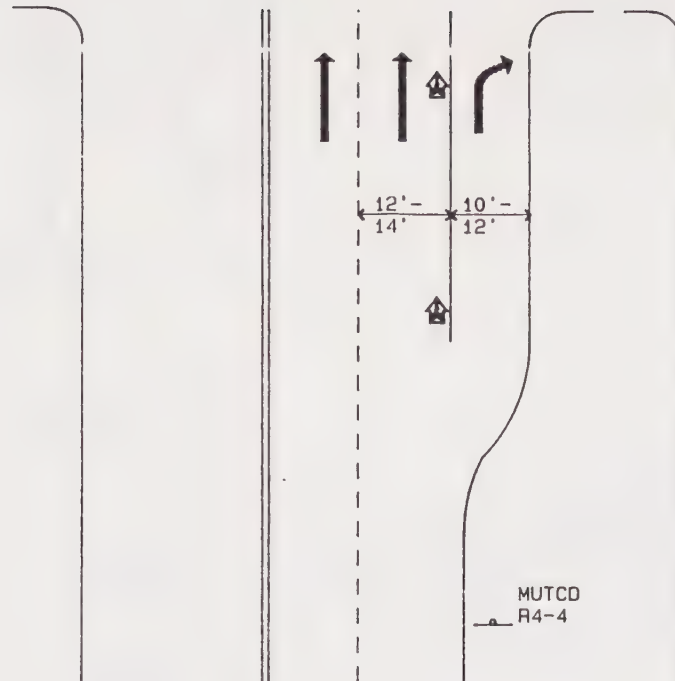
WSA WILBUR SMITH ASSOCIATES

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2670 Leavenworth Street
San Francisco, Ca. 94133

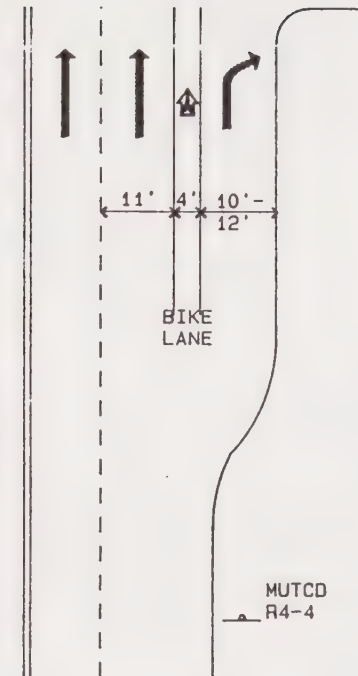
SIGN DETAILS 1-9 & BICYCLE SYMBOL PAVEMENT LEGEND	FIGURE
SAN FRANCISCO BICYCLE PLAN	5-7



MINIMUM STRIPING AT
RIGHT TURN ONLY LANE



SECOND CHOICE STRIPING
AT RIGHT TURN ONLY LANE



PREFERRED STRIPING
RIGHT TURN ONLY LANE

WSA WILBUR SMITH ASSOCIATES

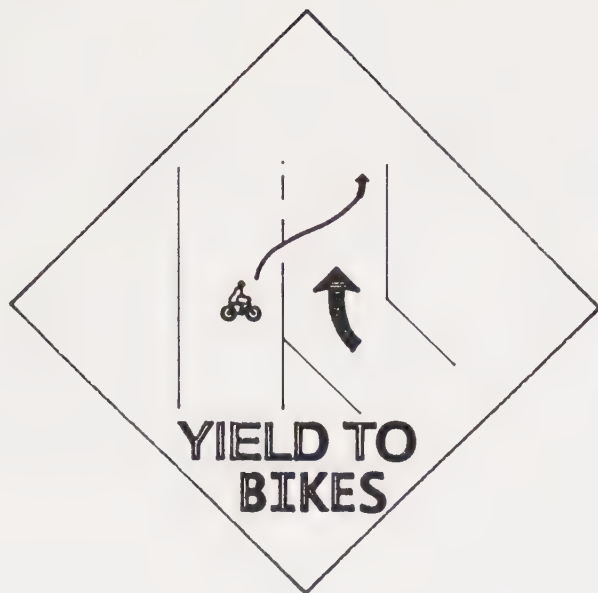
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San Francisco, Ca. 94133

STRIPING/PAVEMENT
LEGENDS AT RIGHT
TURN ONLY LANES

SAN FRANCISCO
BICYCLE PLAN

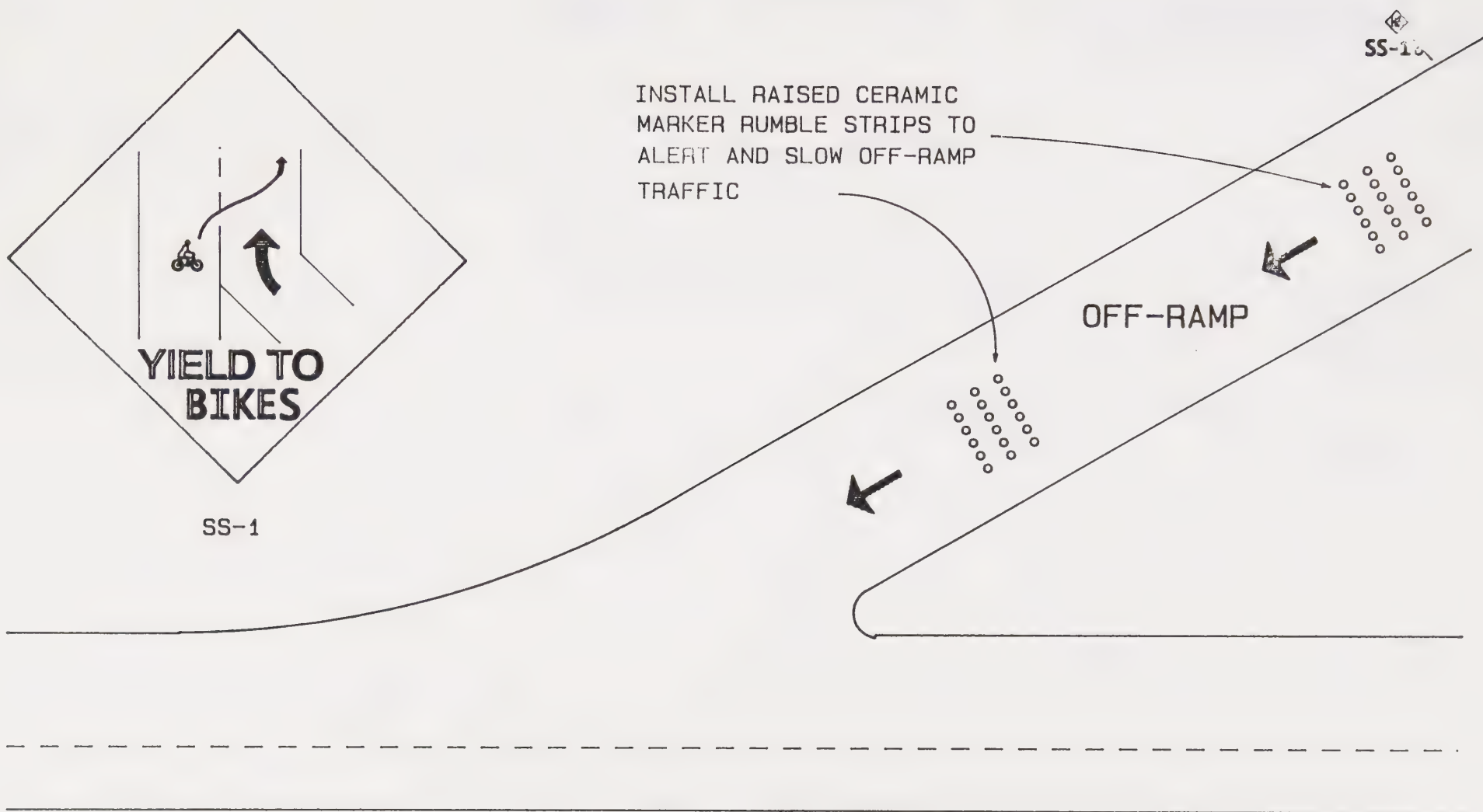
FIGURE

5-8



SS-1

INSTALL RAISED CERAMIC
MARKER RUMBLE STRIPS TO
ALERT AND SLOW OFF-RAMP
TRAFFIC



OFF-RAMP

WSA

WILBUR SMITH ASSOCIATES

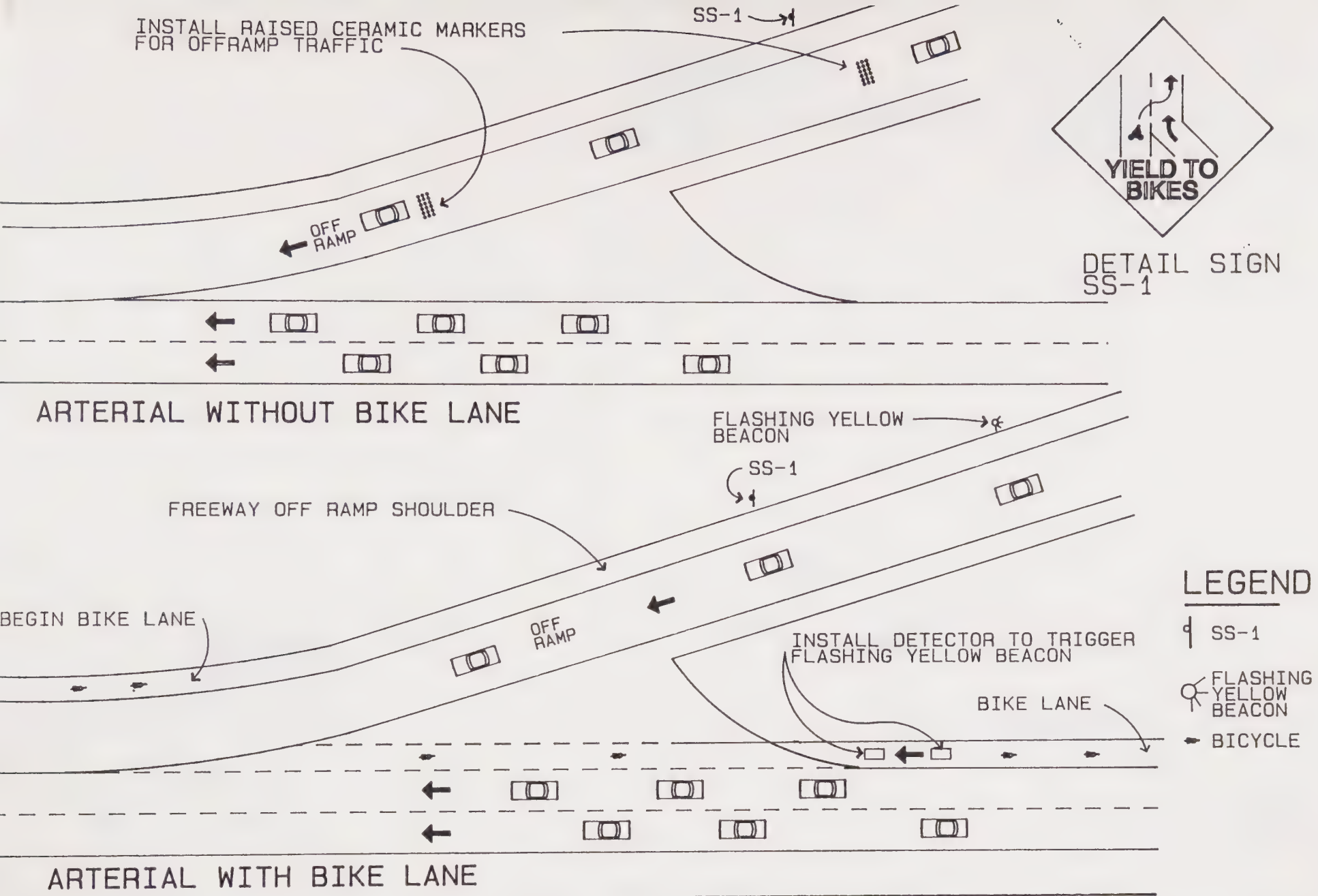
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San Francisco, Ca. 94133

DESIGN TREATMENT AT
OFFRAMP RIGHT-TURN
WITH ARTERIAL

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-9



WSA WILBUR SMITH ASSOCIATES

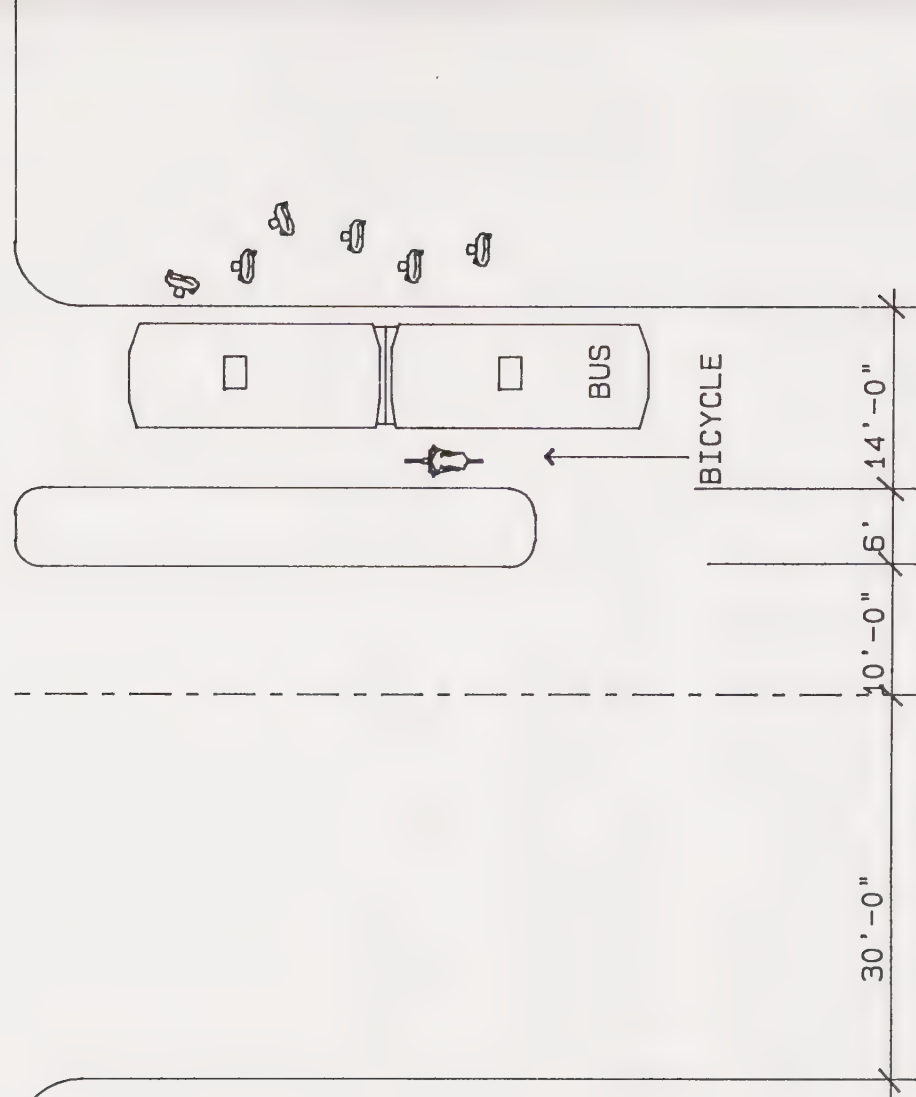
Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

DESIGN TREATMENT AT JUNCTION OF
OFFRAMP WITH ADDED LANE OR FREE
RIGHT TURN LANE WITH ARTERIAL

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-10



WSA WILBUR SMITH ASSOCIATES

Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

MINIMUM DESIGN FOR LANE NEXT
TO TRANSIT ISLAND

SAN FRANCISCO
BICYCLE PLAN

FIGURE

5-11



6. TRAFFIC CALMING

INTRODUCTION

The objective of this chapter is to identify prototype traffic calming measures to apply in San Francisco in order to make bicycling safer and more convenient.

Traffic Calming is the term applied to a variety of physical measures intended to reduce the dominance of automobile and truck traffic in urban areas. Traffic calming measures can be applied as spot improvements to treat an existing problem, such as speeding, or along a corridor to create a bicycle-preferential street, called a bicycle boulevard. Traffic calming does not attempt to ban the automobile, but primarily to reduce the speed of automobile traffic. In some applications, traffic calming measures are employed to reduce "through" or non-neighborhood traffic on certain streets. Aiming for one of these goals usually has the desirable secondary result of achieving the second goal and discouraging the use of the automobile altogether.

Traffic calming measures are virtually all very positive (or at worst neutral) to pedestrian circulation. The resultant traffic noise, speed and air pollution reductions create safer, more attractive, and more livable residential areas. However, if not done with care, traffic calming can adversely impact bicycling at the same time that it reduces auto speeds and/or volumes. On the other hand, traffic calming can be designed to promote bicycling simultaneously with walking and transit.

The goal of this study is to specifically encourage bicycle traffic, not to explicitly slow, discourage or reduce auto traffic. Bicyclists can share the general benefits of traffic calming if the City is selective about the strategies used and measures are carefully designed. If not, there may be disadvantages to bicyclists as well. Traffic calming measures are advantageous to bicyclists if they do one or more of the following:

- Slow vehicular traffic to a speed of 25 mph or less.
- Slow all traffic on a street to a reasonable bicycle speed (about 15 mph), thereby calming vehicular traffic without significantly affecting the majority of bicyclists.
- Eliminate impediments to bicycle travel, particularly unnecessary STOP signs.
- Exempt bicycles from the more restrictive measures, such as the provision of a cyclist bypass through a barrier.

Traffic calming measures that accomplish these objectives can create streets that have less vehicular traffic than adjacent streets, slower speeds, or both, while remaining efficient for and attractive to bicyclists. Such streets are especially suitable for children, inexperienced adults, casual and recreational bicyclists, and others who lack the skill, confidence, or desire to travel on fast, direct routes that also carry heavy vehicular traffic.

Streets that are traffic-calmed specifically for bicycles are referred to generically in this chapter as bicycle priority streets. They are one element of the proposed San Francisco Bikeway Network that also includes bike lanes, bike paths, and streets with wide curb lanes. They are considered a critical component in inducing casual and novice cyclists to begin bicycling, as they provide a low traffic, stress-free, un-intimidating environment for bicyclists. To provide safe, convenient, attractive routes for these riders, as well as a less stressful alternative for experienced cyclists, bicycle priority streets are an essential component of the comprehensive bikeway network. In some cases a traffic-calmed street may be a significantly improved alternative for experienced cyclists as well, due to the elimination of STOP signs. It is impractical to expect that all of a cyclist's trips can take place on a bicycle priority street. But for those routes that serve a particular cyclist's destination, whether he/she be experienced, novice, or child, bicycle priority streets are irreplaceable.

In addition, by slowing vehicular traffic to posted speed limits, safety is dramatically improved for bicyclists and pedestrians. Studies have shown that the probability of surviving a motor vehicle collision increases dramatically for motor vehicle speeds under 30 mph.⁽¹⁾ Thus, traffic calming can also be used to benefit bicyclists (and pedestrians) by incorporating design features on most or all city streets that discourage automobiles from travelling over 30 mph.

Traffic calming has been used with great success in Western Europe, often in compact, dense urban areas similar to San Francisco. It has many proponents in the United States, notably a group called Sensible Transportation Options for People (STOP) in Portland, Oregon. Many bicyclists endorse traffic calming measures (including the San Francisco Bicycle Coalition).

It is beyond the scope of this chapter, or of the Comprehensive Bicycle Plan itself, to evaluate or recommend specific traffic calming plans for San Francisco. Instead, this chapter focuses on the following narrower issues:

- Does traffic calming have advantages for bicyclists?
- If so, which traffic calming techniques are helpful to bicyclists, which are neutral, and which should be avoided?
- How can traffic calming ideas be adapted specifically for the benefit of bicyclists?
- Which streets, if traffic-calmed, would benefit bicyclists the most?

The remainder of this chapter discusses the evolution of traffic calming, applies the concept of Traffic Calming to bicycle priority streets, lists the streets or corridors in San Francisco that could most benefit from traffic calming, describes traffic calming strategies that are compatible with bicycles, and lists criteria for selecting routes for bicycle priority treatment through traffic calming.

Strategies to implement bicycle priority streets in San Francisco will be presented at the end of this chapter.

⁽¹⁾ Transport Research Laboratory, U.K. *Killing Speed and Saving Lives*, 1992.

HISTORY OF TRAFFIC CALMING

Although traffic management techniques of various kinds have been used for decades, modern traffic calming began with the pedestrianization of downtown shopping areas in Germany during the 1960s. Vehicles were excluded completely, and the streets were reserved for pedestrians. As a result of the economic success of these areas and their contributions to historic preservation, pedestrianization of downtowns became the standard practice. In former West Germany, there are now over a thousand central district pedestrian areas. Nearly all cities with a population of over 50,000 have them, as do three-quarters of those with populations between 20,000 and 50,000. These areas range in size from 100 meters to many kilometers.

Woonerven

Complete or nearly complete pedestrianization often implemented in commercial/retail areas. Pedestrian-only areas are particularly feasible in commercial or retail districts where customers and employers arrive via non-auto modes and where deliveries can be made through rear entrances or at off hours. It is less practical in residential neighborhoods, where residents require access at least for their own and visitors' vehicles.

To achieve a pedestrian ambiance while not banning the automobile outright, in the 1970s the Dutch invented the woonerf, or "living yard" (plural woonerven), an area that can be shared by pedestrians and vehicles. The woonerf is designed primarily for pedestrians, who have use of the full right-of-way; children may even play there. Typical design elements of a woonerf include:

- Planters, benches, parking bays, or other obstacles that force vehicles to traverse a narrow and meandering path at a slow speed
- Varied paving materials
- No continuous roadway or footway markings or surface height differences that would segregate pedestrians and vehicles

Within the woonerf motorists must drive at a walking pace and may not hinder pedestrians. These design features, and the idea that autos do not have the right of way, have subsequently been extended to winkelerven (shopping streets) and dorpserven (village centers).

Evolution of Traffic Calming Measures

Woonerven have strict design requirements, are expensive to construct, and are suitable primarily for low-traffic streets. Following the success of woonerven, Dutch and German traffic planners and engineers in the 1980s developed more general techniques for reducing traffic speeds below 30 km/h (18 mph) over a wide area, without the expense of woonerven or the loss of continuity that road closures or one-way streets would bring. The term "traffic calming" is a literal translation of the German "Verkehrsberuhigung." The array of available techniques is discussed in detail below. Pedestrianization and traffic calming techniques have already become widespread throughout Europe and also in Japan. In France and Denmark, these techniques have been adapted to major as well as to minor roads.

In the United States, traffic calming often goes under the name of neighborhood traffic management. Neither the breadth nor the depth of schemes used here approaches their European counterparts, but many of the ideas discussed below have been applied from time to time. The same principles have also begun to see application in areas beyond traffic control. Oscar Newman, an architect and urban planner at Washington University in St. Louis, contends that quiet, private streets can create a sense of community, prevent crime, and reverse urban decay.

In 1992, following a plan developed by Newman, the Five Oaks area of Dayton, Ohio, installed speed humps⁽²⁾ and barriers, pedestrianized streets and alleys, and erected brick and metal gateways. One large neighborhood was divided into eleven mini-neighborhoods, each physically separated from the rest and accessible only from peripheral arterials. The smaller neighborhoods were intended to enhance the sense of community and discourage outsiders, including those with criminal intent, from wandering undetected into the area. Traffic in the Five Oaks area declined by 67 percent, total crimes by 26 percent, and violent crimes by half; remarkably, crime in other areas not did increase. Newman is currently developing a plan for Seattle neighborhoods, and Richmond, CA has also considered adopting his ideas.

In 1991, the City of Portland, Oregon convened a neighborhood congress of 250+ neighborhood leaders to develop a comprehensive plan to control neighborhood traffic. Four major areas of concern were identified:

- i. Traffic speeds and volumes;
- ii. Bicyclist and pedestrian safety;
- iii. Drunk driver and seat belt issues; and
- iv. Alternate modes of transportation.

The draft plan contained over 350 specific objectives and action statements. The plan was published in February 1993, and many streets have since been "calmed" using techniques such as traffic circles, speed humps and median strip barriers.

Traffic Calming in the 1990s

Traditional transportation planning and traffic engineering strive to facilitate traffic flow by increasing capacity and speed. Traffic calming, on the other hand, attempts to slow traffic down. Rather than a direct, straight route, it may provide a circuitous or winding one; rather than wide lanes, narrow lanes; rather than a smooth surface, a rough surface.

The aim of traffic calming is not necessarily to impede motorized travel; a substantial reduction in speed often results in only slightly increased travel times, because the traffic flows more freely. By eliminating delays at stop signs and signals, devices such as traffic circles can decrease travel time even though the average speed of **moving** vehicles is reduced.

(2) Speed humps, or pavement undulations are 12 feet long raised asphalt surfaces over which cars can comfortably travel at 25 mph. They are much different from speed humps which are often used in parking lots and force cars to slow to 5 mph. See Page 6-15 for more discussion of speed humps.

Motorists—and people in general—seem to be willing to tolerate a certain amount of risk in exchange for a corresponding benefit. (This statement does not imply that people are always accurate, or even rational, in evaluating risks.) Speed limits on both state highways and local roads, for instance, are determined on the basis of an engineering and traffic survey. The Caltrans Traffic Manual's standards for the survey assume that 85 percent of drivers travel at or below the safe speed for prevailing conditions, and that, in the absence of unforeseeable hazards, their judgment and experience should be relied on to set the speed limit. The California Vehicle Code expressly states that physical conditions such as width, curvature, grade, and surface, or any other condition readily apparent to a driver, are not grounds for lowering the speed limit.

Thus, while widening and straightening a roadway might be expected to reduce the accident rate, it may instead increase the average speed, since drivers can now travel faster at the same level of risk. Supporters of traffic calming therefore argue that the safety promised by traditional facility improvements is illusory. On the other hand, this argument can also be reversed: lowering the safety limit of the design may decrease speeds (precisely because drivers recognize where this limit lies), but they will adjust their speeds downward only enough for the risk to remain more or less constant. Facilities alone cannot force drivers to operate below this level of risk, and neither can enforcement without changes in current law governing allowable speed limits.

It is true, nevertheless, that while lower speeds may not lead to a decrease in accident rate, they do lead to a decrease in accident severity. There also seems to be a substantial psychological benefit to pedestrians and bicyclists.

BENEFITS OF TRAFFIC CALMING

Traffic and Socio-Economic Impacts

According to its supporters, the ultimate purpose of traffic calming is to maximize mobility while reducing the undesirable side effects of mobility based exclusively on the private automobile. These side effects can include, directly or indirectly:

- Constant and excessive noise;
- Air pollution and its medical consequences;
- The injuries and deaths caused by traffic accidents, including many to pedestrians and bicyclists;
- Devotion of substantial quantities of precious land to roads and to on-street or off-street parking;
- Destruction of houses, neighborhoods, historic buildings, and natural features for highways;
- Urban sprawl, leading to further reliance on the automobile;
- Traffic congestion and long commutes for motorists;

- Heavy traffic on residential streets;
- The decline of public transit;
- Loss of mobility for the poor, the elderly, the handicapped, and children;
- The aesthetic poverty of masses of asphalt, concrete, and metal;
- Crime and fear of crime;
- Dependence on oil companies and oil-producing nations;
- Large personal expenses to buy and maintain automobiles;
- A sedentary lifestyle;
- The expense to government of planning, building, maintaining, and policing roads;
- The expense of providing utilities and services to a spread-out city;
- Deterioration of central and neighborhood business districts that have become difficult to reach;
- Loss of sales tax revenue;
- Decreased personal and commercial property values;
- Loss of property tax revenue;
- Further loss of tax revenue as land is taken out of service for roads and parking;
and
- Loss of the conditions for and a sense of community.

Bicycles and Traffic Calming

Even from this brief history, it is clear that pedestrianization, woonerven, and traffic calming serve primarily to control automobile traffic for the benefit of pedestrians. Bicycles are considered, if at all, only as an afterthought, and if so are generally treated as if they traveled short distances at pedestrian speeds. This approach is inappropriate to conditions in the United States, including San Francisco. It is therefore useful to examine whether traffic calming does benefit bicycles, whether it has inadvertent side effects, and whether its techniques can be modified to bicyclists' advantage.

Benefits - Traffic calming can reduce traffic volume, traffic speed, and accident rates, but its direct effect on bicyclists have received little attention and has not been well documented. Case Study No. 19 of the Federal Highway Administration's National Bicycling and Walking Study, *Traffic Calming, Auto-Restricted Zones and Other Traffic Management Techniques - Their Effects on Bicycling and Pedestrians*, despite its title, reports only a small number of observations:

- In the small town of Buxtehude, Germany, bicycle use doubled in the four years since a traffic calming project was finished. Bicycle accidents also rose, but they were primarily non-injury accidents. The fractions of accidents in which bicyclists were at fault fell from 45 to 35 percent.
- In the Berlin-Moabit area, bicycle use increased by 50 percent, and there was a 16 percent reduction in cyclist accidents.
- In the Koraku section of Minato-ku, Nagoya, Japan, bicycle volume rose along most traffic-calmed routes.
- Groningen, the Netherlands, divided its central area into traffic cells whose boundaries private motor vehicles were not permitted to cross. To travel from one cell to another, drivers must return to a ring road. Bicycling increased substantially, and now constitutes over 50 percent of all trips.
- Bicycle use doubled between 1976 and 1986 in the city of Freiburg, Germany, which has an extensive network of pedestrianized streets, traffic-calmed streets, and bike paths.
- In Vinderup, Denmark, the speed limit on a through road was lowered to 40 km/h (24 mph), and bike paths were constructed along it. Seventy-five percent of bicyclists reported feeling safe riding on the street, compared to 17 percent before the changes (although it is not clear whether the bicyclists were referring to the street or the paths). In addition, 54 percent thought it was easier to cross the road. In Skaerbaek, where similar changes were instituted, bicyclists reported it is had become easier to cross the road, although it took longer to do so.
- Bicycle traffic on the Palo Alto Bicycle boulevard almost doubled over previous levels, and anticipated problems failed to materialize. The bicycle boulevard is discussed at length later in this chapter.
- Bicycle traffic increased on the Berkeley slow street. The bicycle community was reluctant to endorse speed humps, although they had no documented adverse effects.
- There is no history of bicycle-pedestrian conflicts along the Denver transit mall.
- Bicyclists felt adversely impacted by STOP signs introduced for neighborhood traffic management in St. Paul Minnesota.

It is plausible that a decrease in motor vehicle volume and speed would reduce the chance of car-bike collisions, everything else being equal (which is not necessarily the case), however, the hard evidence for improved safety must be considered slight. However, these accounts do show a clear change in bicycle use and in bicyclists' perception of road safety.

Potential Drawbacks - Traffic calming in and of itself is not a panacea for bicycle travel. Bicyclists, particularly experienced bicyclists, can get about efficiently on existing roadways, if (and it's a big if) they are given reasonable surface quality and lane-sharing width. It is not enough by itself, because it does not guarantee surface quality or route directness and continuity. At times it may not even be beneficial, because:

- Traffic calming may restrict the movement of bicyclists as well as motorists.
- Traffic calming may force bicyclists to share road space with pedestrians, although their speeds and movements are very different.
- Traffic calming design features may inadvertently inconvenience or even endanger bicyclists.

Conclusion - If used properly, however, traffic calming can provide routes that are attractive to the majority of bicyclists. In addition, it must be acknowledged that there is a class of bicyclists, (much larger than the existing number of bicyclists in San Francisco) that would ride on traffic-calmed bicycle priority streets but not on major arterials no matter how wide the lane or bike lane. These bicyclists include casual or novice adult riders and children and young teens.

BICYCLE PRIORITY STREETS

The Original Bicycle Boulevard

The first bicycle priority street, called a Bicycle Boulevard, was created in Palo Alto in 1982 along a two-mile section of Bryant Street, a local residential street that is about 36 feet wide. Most of the STOP signs on Bryant Street were removed, and two-way stops were placed on cross streets instead. Bryant Street's intersections with collectors were made four-way stops. Bryant Street intersects one arterial, Oregon Expressway, at an intersection that was already signalized.

These changes created a through route that would have been very attractive to automobiles as well as bicycles, except that it was already interrupted at one point by a natural road closure—a creek that was crossed only by a narrow footbridge usable by bicycles. Two road closures were added at other points along Bryant Street to discourage traffic on the rest of the route. The closures consisted of horizontal wooden power poles placed on the pavement; bicyclists could pass through a gap between the poles and emergency vehicles could clear a concrete block dividing the gap. In all other respects the boulevard functioned as a normal city street, with full access to all residences and on-street parking.

This was the original concept of the bicycle boulevard: a roadway where bicycle traffic has right-of-way priority over intersecting streets, and periodic full-width barriers discourage through motor vehicle traffic. It can be viewed as the exchange of a traffic-calming device unfriendly to bicycles—STOP signs—for another friendly to bicycles (if designed correctly)—traffic barriers.⁽³⁾

⁽³⁾ See Appendix E for a discussion of the disadvantages of STOP signs to bicyclists.

The evaluation of the initial six-month demonstration study reported that bicycle traffic on Bryant Street increased dramatically. High school students constituted a significant portion of the flow. Motor vehicle volumes within the corridor remained fairly constant, indicating that traffic was not diverted to other local streets. Anticipated problems with accidents, access to residences, abusive behavior by bicyclists, and increased moped and motorcycle traffic failed to materialize. The report concluded that *"This test of the bicycle boulevard concept has shown that a predominantly stop-free bikeway corridor on a less traveled, local residential street can be an attractive and effective route for bicyclists."*

In 1986 the footbridge was replaced by a separate, wider bicycle bridge and an improved pedestrian bridge. In 1990, the original wooden barriers were replaced by permanent raised and landscaped concrete islands. The boulevard was extended by two miles in 1992. Where Bryant Street crosses a major arterial, Embarcadero Road, a new traffic signal was installed. Channelization forces automobile traffic on Bryant Street to turn right at this signal, but allows through bicyclists. The signal is actuated by bicycle traffic through pavement detectors and by pedestrian pushbuttons. (This signal was by far the most controversial element of the extension.)

Beyond the signal, an existing drainage dip serves as sort of an inverted speed hump to slow traffic. Several blocks farther on, a barrier was originally installed, but as a result of neighborhood resistance it has been replaced by a traffic circle. Where Bryant Street continues through downtown Palo Alto it receives no special treatment, except for signs identifying it to bicyclists and motorists as a bicycle boulevard. At the Menlo Park border another creek serves as a deterrent to through traffic; a bicycle bridge crossing this creek is one block away.

Creating Bicycle Priority Streets Through Traffic Calming

Bicycle Boulevards can be created on residential streets on which traditional bicycle facilities, such as bike paths and bike lanes are unsuitable. Bicycle Boulevards confer traffic calming benefits on residents and pedestrians as well as on bicyclists who do not necessarily live in the neighborhood. Many bicyclists now use such residential streets. An example is Page Street in San Francisco. However, their utility is significantly decreased by STOP signs at nearly every intersection. The boulevard does not have to be a single straight route; it might also be a circuitous (but flat) corridor like the Duboce-Steiner-Waller-Scott route otherwise known as the wiggie. In addition, bicycle boulevards are relatively inexpensive to implement.

Bicycle priority streets, as envisioned in this plan, will provide bicyclists simultaneously with three advantages that do not exist in the current street network:

1. A low traffic volume alternative where bicycles and motor vehicles can share the roadway without conflicts; and
2. Significantly reduced travel time since bicyclists on the route are granted the right-of-way at as many intersections as possible. This is usually accomplished by converting four-way STOP signs to two-way stops or switching two-way STOP signs to stop the cross street rather than the designated bicycle priority street.

3. A route where two or more bicyclists can safely ride side-by-side. This increases the attractiveness of bicycling to families as well as other cyclists who enjoy conversing during their transport just as motorists and pedestrians do.

Traffic calming strategies are needed to prevent the diversion of motor vehicle traffic to the newly prioritized bicycle street. Although the original concept in Palo Alto employed two motor vehicle barriers, the extension showed that forced turn channelization and traffic circles can also work to discourage through auto traffic. Portland has established a bicycle boulevard on Lincoln Street, an important link between Mt. Tabor Park and residential neighborhoods, using traffic circles and barriers. In fact, as this chapter will discuss, a whole arsenal of bicycle-compatible traffic calming measures is available for use on bicycle boulevards. These measures vary considerably in the level of traffic restriction. The selection of specific measures can be tailored to provide exactly the degree of through traffic control needed at the location where each is placed while minimizing interference with important turning movements.

Two conceptual designs are depicted in Figure 6-1, but virtually dozens of design concepts are possible by mixing and matching the above strategies. Figure 6-2 depicts a more aggressive re-design of a residential street whose existing cross-section is a minimum of 42 feet curb-to-curb. The strategies used will depend on whether the goal is to prohibit through non-neighborhood traffic altogether, or merely slow all traffic to bicycle speeds, or slow all traffic to posted speed limits. In other words, traffic calming can create bicycle priority streets which can, in turn, be implemented by either (1) accepting ambient traffic speeds on residential street but ensuring that traffic volumes remain low enough that bikes and cars can share the road, or (2) re-designing a street for a maximum speed of (for example) 15 mph for both bikes and cars.

Traffic calming techniques can also be used to slow traffic to posted speed limits on virtually all San Francisco streets with speed limits of 35 mph or less. In addition, it is recommended that the speed limits of all streets posted greater than 35 mph be reviewed to determine if such speeds are appropriate for the existing conditions, including curb lane width and ability of motor vehicles to safely share the roadway with bicycles.

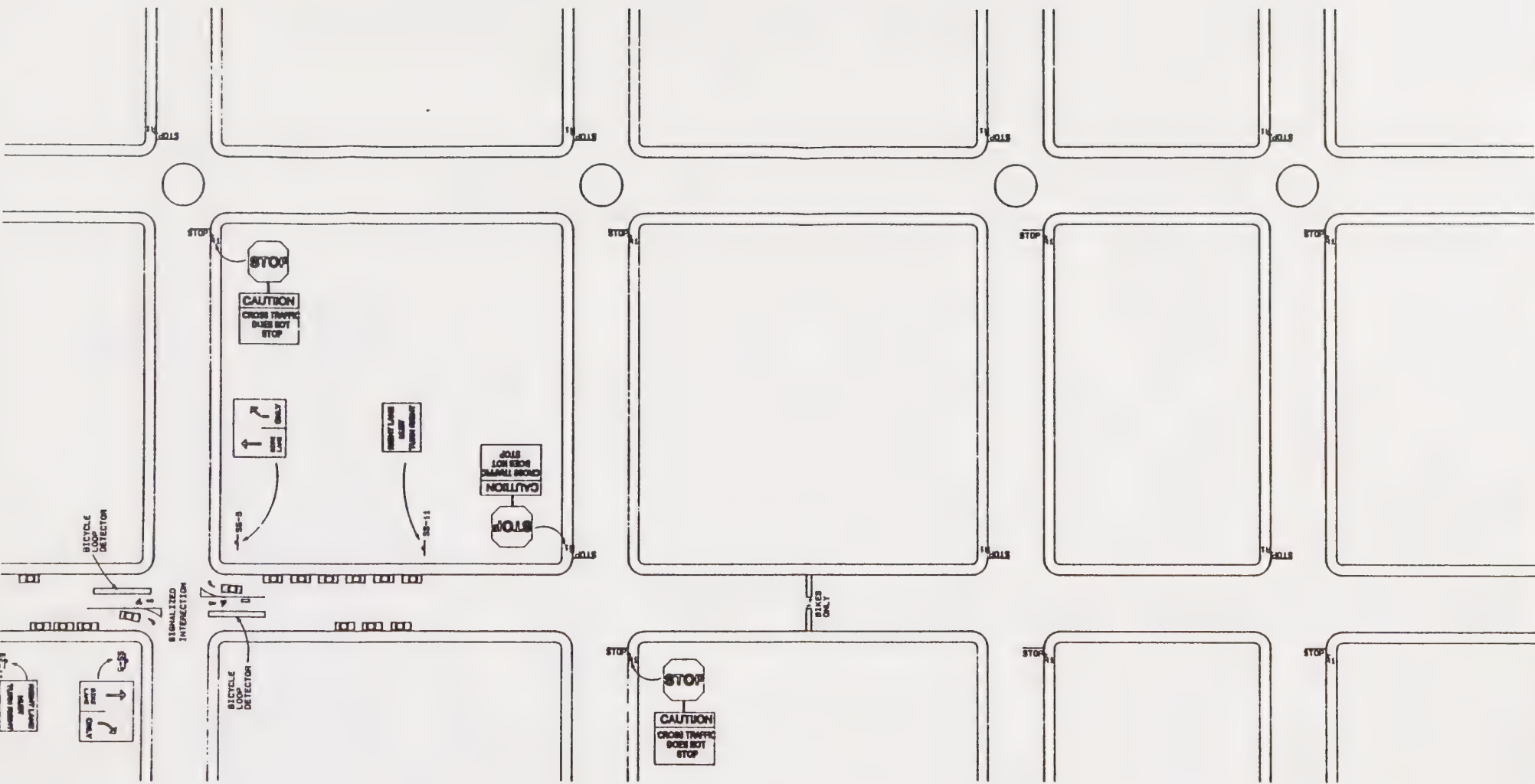
Like most traffic calming measures, bicycle boulevards may meet opposition from some citizens whose circulation patterns are upset or who resist change of any sort. In addition, the boulevard is seldom as direct or as efficient as an arterial, if one is nearby, and is engineered for lower speeds. Experienced bicyclists who prefer arterials should not be expected to use the bicycle boulevard instead, and improvements to the arterial should not be neglected merely because the bicycle boulevard is present. However, even experienced cyclists may prefer a less stressful commute at times.

Recommended Bicycle Priority Streets and Other Streets Recommended for Traffic Calming

The corridors that have been identified as providing the most benefit to bicyclists as bicycle priority streets are:

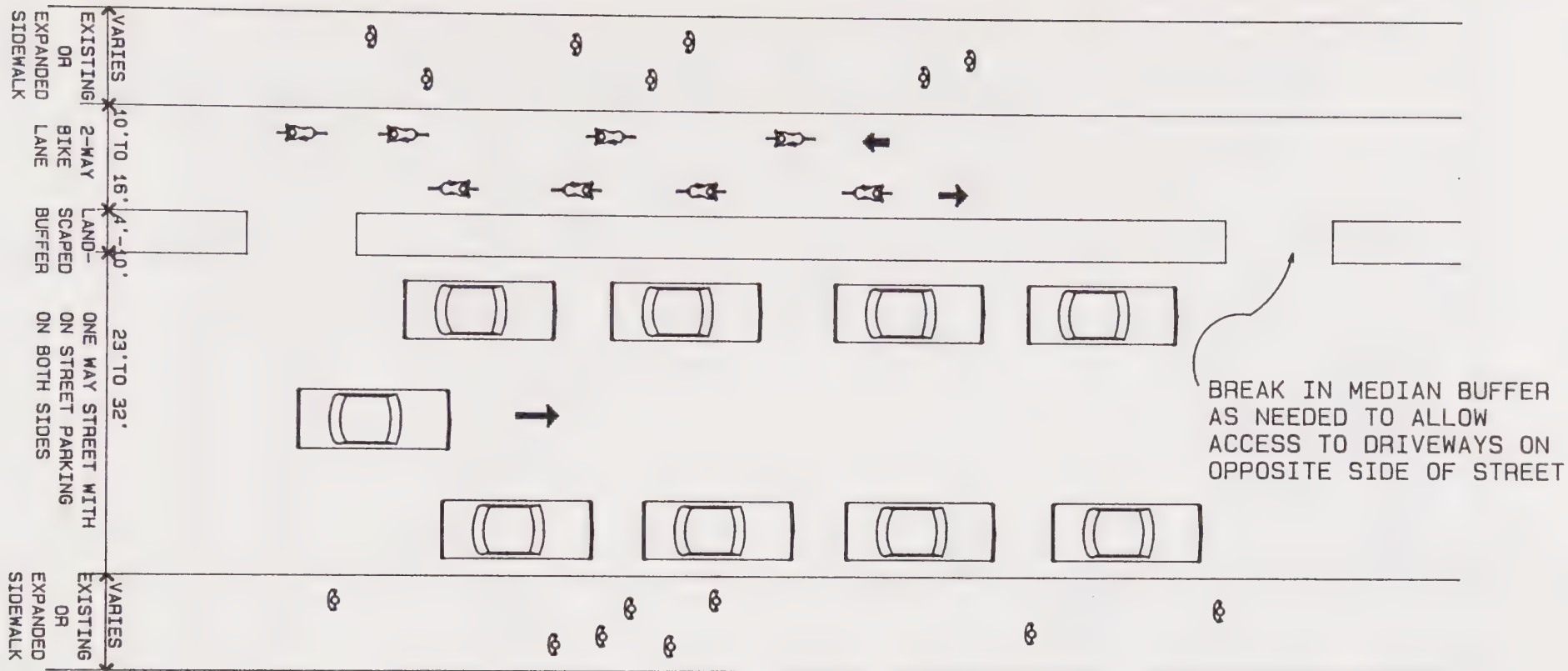
OPTION B-15 MPH DESIGN SPEED
THROUGH TRAFFIC ALLOWED

OPTION A-BICYCLE BOULEVARD
THROUGH TRAFFIC PROHIBITED



WSA WILBUR SMITH ASSOCIATES
 Stevens & Associates
 ARCHITECTURAL & LANDSCAPE CONSULTANTS
 2670 Leavenworth Street
 San Francisco, Ca. 94133

DESIGN OPTIONS FOR BICYCLE PRIORITY STREETS	FIGURE
SAN FRANCISCO BICYCLE PLAN	6-1



OPTION C BICYCLE PRIORITY STREET

WSA WILBUR SMITH ASSOCIATES

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2670 Leavenworth Street
San Francisco, Ca. 94133

MAJOR REDESIGN OF
RESIDENTIAL
STREET CROSS-SECTION

SAN FRANCISCO
BICYCLE PLAN

FIGURE

6-2

- ▶ Cabrillo Street between Great Highway & Arguello
- ▶ Cayuga Avenue between Silver and Foote
- ▶ Clay Street between Webster and Cherry Streets
- ▶ Duboce/Steiner/Waller/Scott⁽⁴⁾
- ▶ Eureka/23rd Street/Diamond Street/Elizabeth Street
- ▶ Francisco Street between Lyon Street and Cervantes
- ▶ Greenwich between Polk and Lyon Streets
- ▶ Harrold between Holloway and Ocean
- ▶ Holloway between Junipero Serra and Harrold
- ▶ Hugo Street between 7th and 3rd Avenues
- ▶ Kirkham Street
- ▶ Pacific Street between Mason and Polk Streets
- ▶ Page Street between Stanyan & Market
- ▶ Sacramento Street between Cherry Street and Arguello Boulevard
- ▶ Tiffany/29th/Chenery/Diamond/Circular Streets
- ▶ Ulloa/Forestside/Taraval between 15th Avenue and Dewey
- ▶ Vicente Street between Lower Great Highway and 14th Avenue
- ▶ Webster between Clay and Broadway
- ▶ 17th Street between Market and Kansas Streets
- ▶ 20th Avenue between Lincoln and Wawona
- ▶ 21st Avenue between Sloat Boulevard and Ocean Avenue
- ▶ 23rd Avenue between Lake and Fulton Streets
- ▶ 34th Avenue between Lincoln and Lake Merced Boulevard

The start and end points for the above recommended streets, at least as far as their bicycle priority status is concerned, are contained in Table 3-1 in Chapter 3. This list is not meant to be a comprehensive list of the only candidate streets for traffic calming but rather a list of the streets that have the highest priority for traffic calming due to their importance to bicyclists. It is certain that, as the City embarks on the public participation process necessary to implement these recommendations, other corridors and streets will be identified. These should be added to the Bikeway Master Plan as they are approved. Recommendations for a strategy to begin a traffic calming program in San Francisco are presented in at the end of this chapter.

In addition, there are numerous streets that are important to bicyclists and have high speed traffic, but which for various reasons do not meet the criteria for bicycle priority streets (see next section), and thus would not be suitable for the maximum treatments as illustrated in Figure 6-1. In some cases, the existing posted speed limit would be sufficient if only it were observed. On these streets, the City should take specific steps to reduce travel speeds such as: synchronize lights at slower speeds, reduce curb radii, eliminate free right-turns, require traffic turning right from the street in question onto a side street to STOP or be under signal control, and, of course, increase enforcement. On residential streets or streets whose speed limits are 25 mph, other measures can be considered such as speed humps/pavement undulations or traffic circles.

⁽⁴⁾ Otherwise known as the wiggle.

The priority streets to reduce travel speeds for the safety of all San Franciscans are:

- | | |
|--------------------------------|---------------------------------|
| ▶ Army Street | ▶ Howard Street |
| ▶ Bay Street | ▶ J.F. Kennedy Drive |
| ▶ Broadway | ▶ Kezar Drive |
| ▶ Bryant Street | ▶ Martin Luther King, Jr. Drive |
| ▶ Bush Street | ▶ Oak Street |
| ▶ Fell Street | ▶ Portola Avenue |
| ▶ Folsom Street | ▶ Potrero Avenue |
| ▶ Golden Gate east of Van Ness | ▶ San Jose Avenue |
| ▶ Guerrero Street | ▶ Third Street |
| ▶ Harrison Street | ▶ Fifth Street |
| ▶ Alemany Boulevard | |

Criteria for Bicycle Priority Streets

Since a bicycle priority street eliminates most STOP signs for through traffic, measures are usually needed to prevent it from attracting motor vehicles as well as bicycles. Measures may also be needed to prioritize the preferred bicycle movements such as left-turn/right-turn movement along the wiggle. As a rule, the primary goal of traffic calming measures on a bicycle priority street is either access control or speed control. Access control need be implemented at only a few points, spaced as widely as half a mile apart, while speed control measures to achieve one or the other of these goals are usually effective only in their own immediate vicinity.

Streets that are candidates for conversion to bicycle priority streets should meet the following criteria:

- The concept has the support of residents. The implementation process for traffic calming measures should have extensive public involvement as discussed in the Implementation section at the end of this chapter.
- The route should appeal to casual bicyclists by being on streets with low traffic volumes.
- The route should appeal to experienced bicyclists by being as direct and fast as possible by giving priority to bicycle travel over motor vehicles.
- The route should not be a street classified as a major thoroughfare or a transit preferential street.
- The route should reduce delays to the bicyclist by assigning the right-of-way to travel on the route.

- On low volume streets (less than about 2000 vpd), motor vehicle access should be restricted only enough so that autos are not diverted from other thoroughfares onto the bike route. On higher volume streets, the degree of restriction will depend on the character and ability of adjacent streets to accommodate any diversion of traffic.
- Intersections with major streets are or could be controlled by traffic signals.
- The bicycle boulevard should not be a major commercial destination.

Consistency with the Transportation Element of the Master Plan

Many of the negative effects of automobile traffic are easily apparent in San Francisco and elsewhere in the Bay Area, California, and the United States. The Preliminary Draft of the Transportation Element of the Master Plan (largely unchanged from the existing language), says:

The impact of automobile traffic on the San Francisco environment is an undeniable problem. Increasing traffic causes more environmental damage in addition to greater difficulty and inconvenience in traveling within the city. Efforts to accommodate the automobile in the city—using land and resources for off-street parking, constructing freeways, designating streets for greater traffic volumes—threaten the attractive appearance and economic viability of the city's neighborhoods. A basic assumption of the Transportation Element is that a desirable living environment and a prosperous business environment cannot be maintained if traffic levels continue to increase. Various methods must be used to reshape the impact of automobiles on the city, including improving and promoting public transit and ridesharing as an alternative to the single-occupant automobile; limiting the city's parking capacity, especially long-term parking in commercial areas; directing major traffic movements to certain routes; limiting the vehicular capacity of the city's streets and highways; and accepting a certain level of congestion in the city as inevitable. . .

Clean air, minimal traffic congestion, a wide array of transportation alternatives and a human-scaled, pedestrian-oriented urban environment attract both residents and businesses. On the other hand, the costs of pollution, congestion, and automobile-oriented development of a scale that is unpleasant and inconvenient for pedestrians are not only measured in urban flight and loss of business, but also in the penalties that may be assessed by local governmental agencies such as the Air Quality District when the blighted conditions are not brought into compliance with established standards.

In 1973 the Board of Supervisors adopted the "Transit First Policy," giving priority to transit investments and adopting street capacity and parking policies to encourage increases in automobile traffic.

Adopting the concept of Bicycle Preferential Streets would be consistent with the Master Plan and with the past action of the Board to encourage transportation alternatives to the automobile.

The selection of an existing low volume street is compatible with both the objectives for bicycle priority streets and the objectives of the Master Plan for local residential streets because:

- Implementation would result in little or no potential to divert traffic to other residential streets;
- No bike lane striping is required to separate bikes from cars; and
- Intersection controls can be modified without increasing delay congestion at critical intersections.

The next section discusses in detail the most beneficial traffic calming measures for this purpose.

GUIDELINES FOR BICYCLE-COMPATIBLE TRAFFIC CALMING MEASURES

Since bicyclists are permitted on all roadways except designated freeways, and therefore everywhere that traffic calming might be used, traffic calming measures should always, at a minimum, be safe for bicyclists. This section discusses traffic calming measures that are safe and can also be used effectively to bicyclists' benefit, for instance, on bicycle boulevards. Other measures that are incompatible with or potentially harmful to bicyclists, or neither helpful nor harmful, are described in Appendix E, "Non-Bicycle Oriented Traffic Calming Measures".

Most of these measures employ physical design features that guide or restrict the movement of vehicles. A few are traffic control devices, including signs, signals, and striping that communicate regulatory, warning, or advisory messages. Design features are usually self-enforcing and are also the most successful designs because police enforcement is usually a short-term service whose benefits end when the police leave. Thus self-enforcing designs are preferred over other designs. However, traffic control devices do not necessarily change driving habits and there may need to be an initial period of education and/or police enforcement for maximum success.

Many traffic calming measures serve more than one purpose. Traffic circles, for instance, both narrow the roadway and force a change in direction. It is also common for installations to implement several measures in combination.

In some cases, it is advantageous to treat bicycle traffic differently from automobile traffic for traffic calming purposes. There are several good reasons for doing this:

- Most residents do not consider bicycle traffic on their streets a nuisance or hazard in the same way as they do automobiles.
- Many bicyclists prefer to ride on streets where automobile traffic is light, such as those that have been traffic-calmed.
- Many cities, including San Francisco, would like to actively promote bicycle travel as an environmentally sound method of transportation.

The following discussion identifies methods for calming motor vehicle traffic that are compatible with bicycling.

Changes in Elevation

Speed Humps - Speed humps, also called pavement undulations or road bumps, are raised areas extending across the pavement surface, typically 3 to 4 inches high and 12 feet long in the direction of traffic flow. They must be carefully distinguished from the high, narrow speed bumps sometimes used in private parking lots and driveways, which traffic engineers do not recommend on city streets. Speed humps are very common in California cities.

Speed humps are meant to cause discomfort to occupants of vehicles that exceed the design speed, and are usually installed in a series of two or more. Improperly designed, speed humps and all speed bumps are dangerous for bicyclists. They can damage the wheels or frame, or it can knock the bicyclist down. Conventional narrow speed bumps, for instance, are known to have caused at least one bicyclist death, and every speed bump design that has been tried is dangerous for some class of vehicles.

Fortunately, properly designed speed humps, with gentle approach and exit gradients, flush leading edges, and smooth surfaces, do not seem to pose a significant hazard to bicyclists. British government research found that 92 percent of users of two-wheeled vehicles had no trouble crossing 0.1-meter (4-inch) humps. The California Traffic Control Devices Committee's *Subcommittee Report on Pavement Undulations* found that bicyclists may experience loss of control at speeds approaching 20 mph for a 4-inch hump, or 25 mph for a 3-inch hump. The report found no problem at speeds of 15 mph or less.

With one exception—hills—bicyclists are unlikely to exceed 25 mph on residential streets, and few will exceed 20 mph. Thus, both 3-inch and 4-inch humps are likely to be safe for bicyclists, although the 4-inch hump should probably be used with caution where bicycle traffic is frequent or rapid. Humps can be tapered near the curb or have cuts in them to allow bicyclists to bypass them, although this practice is not strictly necessary and can encourage gutter-running (driving with one wheel in the gutter) by motorists. It is also important to ensure adequate warning signs and markings. The exception to these bicyclist speeds is on hills. (The death referred to above occurred on a steep hill.) Bicyclists who inadvertently approach a hump at high speed might risk serious injury. It is also possible that a hump could cause a slow bicyclist to lose control on a steep uphill grade. The City of Oakland will install speed humps only on residential streets and only on streets with grades less than 5 percent.

Speed humps are normally used only on local streets—usually residential streets, although Portland has tested a 22-foot long speed hump for use on collector streets. Since 1988 the City of Palo Alto has experimented with 3-inch high humps on several residential streets. The humps do not appear to impede or pose a hazard to bicycle travel.

Speed humps should be located far enough from intersections that turning cyclists are no longer leaning when they encounter the hump. Finally, maintenance should ensure that raveling of the hump's edge does not produce irregularities, gaps, or debris that could impede or endanger bicyclists.

Speed Tables - A flat-topped hump is called a speed table; its length in the direction of travel can be much greater than that of a conventional hump. Speed tables, usually distinctively paved, are often used at pedestrian crosswalks, where they must extend curb to curb and no cyclist bypass is possible. Otherwise, considerations for speed tables are the same as those for speed humps and for textured surfaces.

Raised Intersections - A raised intersection is similar to a speed table, but extends across the full width of an intersection on all four approaches. Raised intersections have been used extensively in Europe for residential traffic management, and occasionally in the United States in shopping areas. As with speed humps and tables, the approach and exit gradients should be gentle, and the surface should be smooth but not slippery.

Roadway Narrowing

Lane Narrowing - Restriping of roadways to provide fewer lanes, or narrower lanes, can create enough room for a bicycle lane or a curb lane wide enough for bicyclists and motorists to share comfortably. For instance, Seattle has restriped some streets from four lanes to two plus a two-way left turn lane and bicycle lanes. At the same time, fewer lanes or narrower lanes may tend to reduce vehicle speeds. Such modifications can be viewed either as the roadway being restriped to accommodate bicycles, or as bicycle lanes being used as a means to calm traffic. However, narrowing lanes such that bicycles and motor vehicles are forced to share a lane less than 14 feet wide is not bicycle compatible and should not be considered.

Traffic Circles - Small traffic circles, also called mini-roundabouts or speed control islands, have been used with great success in Seattle's Neighborhood Traffic Control Program, where they are installed at the request of citizens. Located at the center of an intersection in place of STOP signs or traffic lights, traffic circles both narrow the roadway and force motorists to change direction. They may also produce the visual impression of a dead-end street, at least to strangers.

Although traffic circles seem relatively benign, recent trial installations in the Willows neighborhood of Menlo Park have produced heated controversy among residents. A letter to the editor in opposition to them cites traffic diverted to other neighborhood streets, reduced emergency vehicle response times, traffic hazards, "*reduced property values due to the slumlike visual connotations of the obstacles,*" and the cost of the circles themselves.

The bicyclist's objection to all these means of narrowing the roadway is the same. Unless the narrowing is substantial and frequent, any reduction in vehicle speed is usually small. At the same time, the narrow lanes tend to squeeze motorists and bicyclists together. To avoid this conflict, the roadway should remain wide enough for lane-sharing—about 12 feet or wider, depending on traffic volume; otherwise additional traffic calming techniques should be used along with the narrowing, or a cyclist bypass should be provided if geometry permits.

Of all the roadway-narrowing measures, small traffic circles seem to be the most comfortable for bicyclists. This may be because they inherently combine several traffic-calming techniques; because they do not create a competition for the remaining space; or because they are often used on roadways that already carry relatively little traffic. In addition, the elimination of STOP signs that they make possible is highly beneficial to bicyclists. They are not, however, free of controversy. Some bicyclists object to the complication and confusion of turning and crossing movements, the

decreased clearance between bicyclists and cross traffic, and the danger of left-turning motorists who shortcut the circle clockwise to avoid traveling counterclockwise three quarters of the way around it. In addition, bicyclists would be better served by stopping the side street traffic to give travel on the street in question the right-of-way. This is especially true if the side street has significant traffic volumes.

A well-designed traffic circle employs a small size and sharp deflection at entry to force entering traffic to slow drastically and to continue slowly around the circle. A small triangular island at the entry can force a right turn, eliminating shortcuts, and also provides a pedestrian refuge.

Changes of Direction

Reduced Corner Radii - Reducing the corner radius at intersections to as little as 7 feet both slows down the speed of turning traffic and reduces the distance pedestrians must cross. It is an effective technique in high-pedestrian areas, and can also be used to reduce the speed of traffic entering the cross street. However, large trucks may not be able to negotiate the turn without overrunning the curb.

This technique can also be applied on arterials, although the geometry is larger—reducing corner radii from 50 feet to 30 feet at freeway on-/off-ramps, for example.

Restricted Movements

Road Closures/Traffic Barriers - As used here, "road closure" refers to closing a road at one point, either at an intersection (creating a cul-de-sac) or midblock (creating two cul-de-sacs). It does not mean closing an extended portion to vehicular traffic, as authorized by Vehicle Code §21101(a), which might be done to create a pedestrian area. In Europe, such a point closure is called an "environmental" road closure. The closure is usually accomplished by installing a barrier, whose design can vary from an asphalt berm to a set of posts or bollards to a sculptured and landscaped island to a full cul-de-sac with curb and gutter. These designs differ in cost, appearance, and ease of maintenance but not in basic functionality.

Traffic barriers are sometimes called diverters, since when traffic is blocked from one street it does not usually disappear, but is instead diverted to another nearby street. This chapter uses the term "barrier" for a device that blocks movement completely, and reserves "diverter" for a device that restricts some movements, usually the through movement, but allows other traffic to continue. Many Bay Area cities have installed traffic barriers, notably Berkeley and Palo Alto, to prevent commute traffic from cutting through neighborhoods. Barriers are the most extreme traffic calming measure, and are, of course, highly successful in reducing traffic volume and speed near the installation point. Barriers also tend to be highly controversial and are unpopular with some citizens since they restrict access for residents and visitors as well as outsiders.

Barriers can create two kinds of problems for bicyclists:

- They do not always allow easy bicycle passage. (In the case of barriers constructed of guardrail, like some in Berkeley, they may not allow passage at all.) This is primarily a matter of barrier design. If the barriers are constructed with bicyclists in mind, they can continue to allow unrestricted bicycle access.
- Because motorists look in directions where they expect to see other motorists, they fail to anticipate bicyclists who suddenly enter an intersection across or through a barrier. This problem is primarily a matter of barrier placement. It can be avoided with proper placement and with notification to either bicyclists or motorists that they must yield.

In order to prevent these potential problems as well as potential neighborhood opposition, exceptional attention must be paid to the selection of a location for barriers as well as the details of the design and placement.

Barrier Design - Every barrier should have a gap or opening to allow bicycle passage. To allow for trailers and adult tricycles, the gap should provide a clear width of at least 5 feet (Highway Design Manual, Topic 1003.1), although as little as 4 feet can be workable. The practical maximum is 5 feet 6 inches, set by the width of an automobile. On a two-way street this clear width should be provided for each direction of bicycle travel, either by two separate approximately 5-foot openings or a single approximately 10-foot opening in the center, divided by a concrete block or a 4-inch diameter, 4-foot high locking barrier post. The single opening has the advantage that it can allow passage of emergency vehicles.

In some cases it may be necessary to prohibit parking near the barriers by means of signs or red curbs to preserve access to the openings. The exact location of the openings between the center of the road and the curb is not usually critical as long as the guidelines below for placement of the barrier itself are followed.

The barrier itself should be liberally identified, as appropriate, with single white or yellow reflectors, diagonal reflector arrays, edge reflectors, and reflective tape or paint. The upper half of posts should be wrapped diagonally with parallel stripes of orange and white reflective tape for maximum visibility day and night, and a 2-by-10-foot envelope should be painted on the pavement around the post.

Plantings on landscaped barriers or closures should not obstruct sight lines, and should minimize the shedding of leaves, seeds, fruit, or nuts onto the roadway.

Barrier Placement - The relevant principle is that on the far side of a barrier, bicyclists should not immediately encounter cross traffic at intersections or driveways. This means that full barriers should not be placed directly at intersections, but set back at least 50 feet from any cross street or business driveway. (Fifty feet is a reasonable stopping distance, including reaction time, for a bicyclist traveling at 15 mph.) With some designs and at some locations, it may be necessary to prohibit on-street parking or to trim foliage to provide adequate sight lines.

This placement also ensures that bicyclists who are leaning to turn onto a street with a barrier have a chance to return to an upright position by the time they encounter the barrier, and therefore to pass through the barrier safely.

Half Closures - The road is closed at one point by a barrier but only across half its width. This is almost always done at the street entrance, allowing traffic to exit but blocking it from entering and creating a *de facto* one-way street for one block (except for traffic that originates within the block). Where the half closure includes a bypass for bicycles to enter, the result resembles a contraflow bike lane without that design's inherent disadvantages.

The same design considerations for bicycles apply to half closures as to full closures, although a half-width barrier needs only one opening. The preferred location at a street entrance is satisfactory, since there is no conflict with cross traffic on the far side of the barrier.

Half closures have the advantage of greater flexibility in placement than full closures. Although they can be physically violated by motorists fairly easily, the rate of violation should still be relatively low since motorists must consciously decide for example to enter a one-way opening. By the same token they offer easy passage to emergency vehicles. The security of half closures can be improved by extending a concrete median beyond the barrier (provided that it does not block access to driveways or parking, and even this can be provided to some extent by openings), forcing drivers to travel on the wrong side of the road for prolonged distances in order to circumvent the barrier.

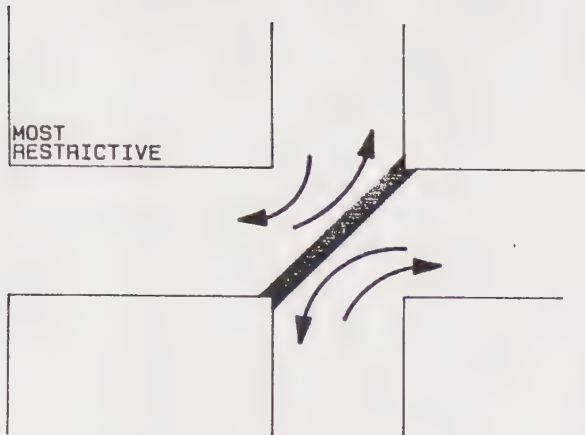
Diagonal Diverters - A diagonal diverter is a barrier placed diagonally across the full width of an intersection, creating two L-shaped streets touching but not connected at the corners. Again, Berkeley is the prime example in the Bay Area of the use of the diagonal diverter although its use of them is not particularly bicycle friendly. Diagonal diverters are also used in Eugene and Seattle.

Diverters may be less objectionable to motorists than barriers, but they can be unsatisfactory to through bicyclists, who (depending on the diverter geometry and bicyclist maneuver) may be exposed to unsuspecting cross traffic on both sides of the diverter. Since they function only in intersections, there is no flexibility in diverter placement. The design should therefore provide an opening that is both wide enough for passage and long enough in the direction of travel to create a refuge: 6 feet for a bicycle, or 10 feet for a bicycle plus trailer. This length can most easily be provided if the diverter is constructed as a tapered island or as a permanent landscaped closure, although it can also be created by a double row of bollards.

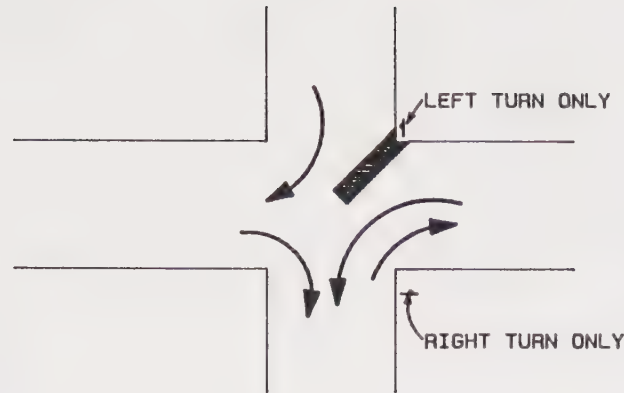
Since the purpose of the diagonal diverter would be to track most of the traffic into a forced right- or left-turn, such as at Steiner/Waller, it is suggested that the bicycles allowed through the diverter be required to yield to on-coming traffic on the other side, be it motor vehicle or bicycle.

Figure 6-3 shows several variations of diagonal diverters and alternatives to diagonal diverters that can prioritize the left-turn/right-turn movements needed to execute the Duboce Wiggle.

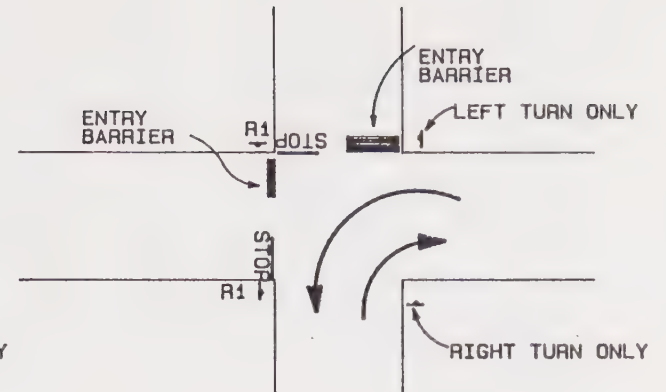
Truncated Diagonal Diverters - As used in Seattle, one end of the diagonal diverter does not extend fully to the corner, permitting right turns as well as left turns on one of the four streets, while continuing to prevent all through movements. It would be possible to vary the design even further to widen this gap, permitting left turns as well as right turns on the intersecting street, or to provide



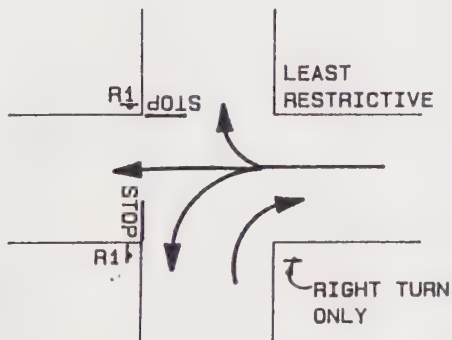
DIAGONAL
DIVERTER



TRUNCATED
DIAGONAL
DIVERTER



CURB EXTENSIONS



STOP SIGNS-ONLY

WSA WILBUR SMITH ASSOCIATES

Stevens & Associates
ARCHITECTURAL & LANDSCAPE CONSULTANTS
2670 Leavenworth Street
San Francisco, Ca. 94133

ALTERNATIVES FOR
PRIORITIZED BICYCLE
MOVEMENTS AT 90° TURNS

SAN FRANCISCO
BICYCLE PLAN

FIGURE

6-3

gaps at both ends, creating a kind of diagonal median barrier. These may need to be used in conjunction with STOP signs to assign right-of-way to certain movements.

Median Barriers - Median barriers are currently used in virtually every city on major arterials where they separate opposing directions of traffic and prevent left turns to and from minor streets. For traffic management purposes, short median barriers can also be placed at intersections to prevent through movements. These barriers differ from the median islands discussed above under "Roadway Narrowing". Median islands are placed along the traffic-calmed street to narrow it, while median barriers are placed perpendicular to it along the centerline of the cross street to prevent traffic from entering or continuing. (A single barrier can serve both purposes on intersecting streets.)

The usual median barrier permits right turns and prevents left turns, but design modifications can add one or two of the four possible left turns according to need.

To suit bicyclists' needs, the barrier must have a bicycle bypass (or two, depending on design). If it crosses a busy uncontrolled intersection, it is best designed as an island that includes a bicycle refuge.

Forced Turns - Traffic can be forced to turn right rather than continue straight by a pork-chop shaped island, similar to the familiar type used for free-running right turns, but extending further to the left to block through travel. It is easy to incorporate a bicyclist bypass around or through the island. With some geometries it might be possible to force left turns as well—for instance, offset intersections, turns from one-way streets, and turns from the right arm of a T intersection.

Unlike diagonal diverters and median barriers, this method leaves the interior of the intersection clear. The right-hand curb radius may need to be increased to accommodate the forced turn, and large trucks may not be able to negotiate it.

Signs and Markings

Speed Limits - The basic speed law in California is that no person may drive faster than is reasonable or prudent, having due regard for weather, visibility, traffic, and roadway surface and width. It is a defense to a speed limit violation to establish that an excessive speed (but not greater than 55 mph) complied with this basic speed law.

The speed limit in business and residential districts (on roads that are not state highways) is 25 mph. Except in transition areas where the speed limit decreases, posting signs to this effect is generally useless in increasing compliance.

Cities and counties may raise the 25 mph limit if they determine, on the basis of an engineering and traffic survey, that doing so would facilitate the movement of traffic and would be reasonable and safe. They may also lower it—to 15 or 20 mph—only on a "street having a roadway not exceeding 25 feet in width" and "near schools and senior centers", and in each case only when justified by an engineering and traffic survey. As mentioned earlier, the law expressly states⁽⁵⁾ that physical

⁽⁵⁾ Vehicle Code §22358.5.

conditions such as width, curvature, grade, and surface, or any other condition readily apparent to a driver, are not grounds for lowering the speed limit, since the basic speed law is sufficient to cover them.

The ordinary speed limit of 25 mph is reduced to 15 mph in alleys and within the last 100 feet of an approach to an obstructed-view railroad crossing or obstructed-view uncontrolled intersection. According to Vehicle Code §110, an alley is any highway having a roadway 25 feet in width or narrower that is used primarily for access to the rear or side entrances of abutting property. Interestingly, San Francisco has been granted an exception to this definition. "Due to circumstances peculiar to the City and County of San Francisco," which the Legislative finding does not specify, San Francisco may by ordinance or resolution designate any highway that has a roadway 25 feet wide or narrower as an alley; there is no condition that it be used for access to rear or side entrances.

This exception gives San Francisco the unique ability to set the speed limit on narrow streets to 15 mph without the justification of an engineering and traffic survey. Some residential streets may be narrow enough to qualify for this lower limit. Moreover, the Vehicle Code defines the roadway as the "*portion of a highway improved, designed, or ordinarily used for vehicular travel*," and the courts have held that this does not include the parking area.⁽⁶⁾ With the parking area excluded, many more streets could qualify as alleys.

In addition, because a bicycle is not defined as a vehicle under California traffic law, bicycle lanes are part of the highway but not the roadway. Striping bicycle lanes on a street so as to reduce the remaining roadway to 25 feet or less—two 12-foot lanes are perfectly adequate for two-way traffic—would make it eligible for designation as an alley and an automatic 15 mph speed limit.

This exception overcomes the legal obstacle to setting 15 mph speed limits, but not the practical one. Since most drivers normally travel at a speed that they feel is comfortable for conditions, a 15 mph limit is likely to need either significant roadway re-design or significant police presence and enforcement to ensure compliance. It should be reserved for special cases where a low speed limit would be acceptable to residents.

Coordinated Traffic Lights - This strategy is usually thought of as facilitating traffic flow not calming it. It is usually employed to enable traffic to travel at a higher average speed than it could without coordination. But coordinated traffic signal timing also removes any advantage for motor vehicles to travel faster than the speed for which the traffic signals are timed. Of particular relevance to bicyclists is that a signalized arterial could be coordinated for bicycle speeds rather than motor vehicle speeds. This has been done in Portland, where downtown streets are timed at 14 mph. This can be done in San Francisco to reinforce lower speed limits or existing low speed limits. Air Quality impacts should be minimal as motorists will quickly learn the optimal travel speed to avoid excessive idling. Supplemental signing posting the speed for which the signals are timed would shorten the learning curve.

⁽⁶⁾ *Blanton v. Curry* (1942) 20 Cal.2d 793.

Changes in Surface

Irregular or Textured Surfaces - Brickwork or pavers of various colors, shapes and patterns can be used to set off a crosswalk, the entrance to a pedestrian area, or the entire area itself. The warning is primarily visual, although motorists may notice mild noise or vibration. For bicycle safety, the surface should be free of steps, longitudinal or diagonal grooves, or other irregularities that could cause a fall, should not be slippery or become so when wet, and should not be so rough that it causes an uncomfortable ride. These concerns are not a problem with some common designs. Any proposed use of such textured pavements done in consultation with the Bicycle Coordinator and the BAC.

Summary of Bicycle-Compatible Measures

Assuming that the design guidelines just described are observed, the most bicycle-compatible traffic calming measures are the following:

- Speed humps, speed tables, and raised intersections can produce small but consistent speed and volume reductions, but only in their immediate vicinity.
- Traffic circles are acceptable on streets whose volume is already fairly low, and moderately effective in reducing both speed and volume.
- Reduced corner radii can slow the speed of turning traffic. They are most likely to be useful on a bicycle priority street in combination with other measures that operate midblock. But they can also be useful in making junctions with on- and off-ramps safer for bicyclists. The elimination of right-turn channelization pork chop islands would also slow turning traffic if the curb radii were also reduced.
- Road closures (traffic barriers) are the most coercive and therefore most effective of all traffic calming measures.
- Half closures are less intrusive, offer greater flexibility in placement, and allow emergency vehicles to pass.
- Forced turn channelization can be highly effective if existing geometry permits it to be used, and is less coercive than road closures. It is a good substitute for diagonal diverters.
- Median barriers, like half closures and forced turns, prevent through vehicular movements but can be configured to permit other movements. If there is significant uncontrolled cross traffic, the median can include a bicycle refuge.
- 15 mph speed limits slow vehicles significantly but have little adverse effect on bicycles.
- Traffic signals can be coordinated for a speed suitable to bicycle travel, e.g. 8-15 mph.

- Textured surfaces have little effect by themselves, and would be most useful as a visual cue to reinforce more restrictive design features.

LEGAL ISSUES

The legal authority for many traffic calming measures is Vehicle Code §21101(f), permitting local authorities to prohibit entry to or exit from any street by means of islands, curbs, traffic barriers, or other roadway design features. Traffic control devices or markings placed on the barriers must conform to the uniform standards and specifications of §21400. There are two ways of permitting bicyclists to pass through road closures, diverters, forced turns, or median barriers on a bicycle boulevard (or elsewhere) while preventing motorists from doing so:

- The barrier to passage is a purely physical one. There is no legal prohibition against crossing the barrier, but its design simply allows bicycles while interfering with motor vehicles - for instance, an opening wide enough for bicycles but too narrow for automobiles. With this approach, warning signs such as W3 (turn arrow), W57 (single head arrow), W53 (Not a Through Street), W81 (chevrons), and many others would be permissible, but regulatory signs such as R11 (Do Not Enter) would not. There is no practical way to exclude motorcycles, mopeds, or motorized bicycles.
- A regulatory sign prohibits passage—for example, R11 (Do Not Enter) or R41 (Right Turn Only)—and violating it has legal consequences. In this case there must be an exception for bicycles. Palo Alto sometimes installs an "Except Bicycles" plate on signs of this sort at barriers, but such a distinction is not specifically permitted under state law.

Both approaches run into difficulties with §21101.6, which prohibits local authorities from placing *"gates or other selective devices on any street which deny or restrict the access of certain members of the public to the street, while permitting others unrestricted access to the street."* Although intended to codify a court decision prohibiting key-operated gates open only to residents, and to prevent discrimination based on drivers (rather than on vehicles), this section nonetheless poses a significant obstacle to selective regulation of motor vehicles at traffic barriers. This issue, and proposed amendments to state law to deal with it, are discussed at greater length in Technical Memorandum #12.

Local authorities are permitted to regulate turning movements at intersections by placing signs or other traffic control devices, and it is unlawful for vehicular traffic to disobey these signs (§22101). Again, there is no explicit provision for distinguishing bicycles.

Conceivably, a short section through a barrier could be designated as a bicycle path (if it were at least 5 foot wide for one-way travel, as required by Caltrans standards), legitimizing the distinction between bicycles and motor vehicles.

COMMUNITY SUPPORT FOR TRAFFIC CALMING

Introduction

The purpose of this section is to recommend an appropriate approach for the successful implementation of community based traffic calming measures. This segment of the Plan begins by reviewing the current community involvement measures that exist in San Francisco. Next, the requirements of various traffic calming measures will be discussed. Key elements of the approaches that have been used in other cities are also reviewed. Based on the relative successes that have been achieved by other implementation programs, similar characteristics currently present in San Francisco are discussed. Finally, a step by step approach is recommended for the implementation of future traffic calming measures.

Current Community Involvement Efforts

The City of San Francisco has not had an aggressive community outreach effort to support the implementation of various traffic calming measures that might advance the goal of greater bicycle usage. This is primarily the result of three key factors:

1. The City currently has only one full time staff member dedicated to all aspects of the bicycle program. The development of increased traffic calming measures as it relates to the bicycle program is only one small aspect of his duties. Although coordination efforts have been made to include "bicycle elements" in various Department of Public Works and Department of Parking and Traffic projects, there has not been a specific outreach effort to initiate neighborhood traffic calming measures.
2. With the exception of the San Francisco Bicycle Coalition's focus on the Haight-Ashbury Neighborhood, there have been no coordinated outreach efforts to determine what each neighborhood wants relative to traffic calming.
3. There is a general assumption among Department of Public Works and Department of Parking and Traffic staff that most city residents are interested in seeing increased auto improvements for their personal use, i.e. more on-street parking, more signalization and less auto traffic and slower traffic on their neighborhood streets. These opposing objectives are difficult to rationalize given both bike and transit objectives. Because of reduced budgets and staffing levels, and given the perception that no one wants to reduce traffic in the neighborhoods in exchange for increased bicycle usage, no significant public efforts have been put forth.

The major bicycle related community outreach effort that has been pursued by the City of San Francisco is the "*San Francisco Bicycle Facility Improvement Program*" or "*Spot Improvement Program*". This program provides return postage paid improvement request forms in shops and locations frequented by bicyclists. The program is designed to provide low cost improvements suggested by concerned cyclists such as signage, pavement striping, rack installation, and pavement maintenance. The program has been successful. However, it is not the type of outreach program that supports a significant traffic calming effort that might serve an entire neighborhood.

In addition to this program, the City established the Bicycle Advisory Committee (BAC). The BAC has successfully recommended commuter bicycle routes, reviewed plans for the Presidio and Golden Gate Park, and assisted in the review of the on-going planning efforts associated with this plan. However, this committee has not yet initiated an outreach program specifically designed to implement and encourage traffic calming measures within the City.

Approaches Used by Other Cities

The key element that characterizes successful traffic calming programs in other cities is a high level of citizen participation. "Grassroots initiatives" have successfully brought about significant traffic calming programs in Portland and Eugene, Oregon; Seattle, Washington; Palo Alto and Davis, California; and New York. The major elements common to these programs are as follows:

- **Organized Citizen Groups** - Each of these cities had volunteer citizen groups that either orchestrated or contributed to the development and implementation of a strong traffic calming program. The *"Auto Free New York Coalition"* began the work in New York that brought about the Greenwich Village Traffic Calming Study. The very successful traffic calming program that is currently being implemented in Portland was aided by two strong citizen groups: the Bicycle Transportation Alliance and the Willamette Pedestrian Coalition. Many bicycle programs are often inhibited, stalled, or suspended due to changes in public transportation agency staff and funding cutbacks. The existence of a strong citizens group can help maintain a consistent policy approach and influence the allocation of additional public resources for bicycle facilities.
- **Established Goals and Specific Objectives** - Successful programs had specific objectives that were endorsed and incorporated into various city agency planning documents. For example, the City of Portland established a goal in the 2040 Plan for a 5 percent bicycle mode split for commuter work trips. The New York City Transportation Commissioner approved a policy in June, 1991 that would increase bicycle usage by 25 percent by the year 1995. Because this goal was endorsed at the City's commission level, it applied to numerous departments, not just the sole City agency for which the Bicycle Coordinator position works.
- **Specific Procedures for Traffic Calming Implementation** - In those cities with successful traffic calming programs, there were specific steps that individuals and neighborhood groups could utilize to obtain funding for their programs. In some cases these steps involved surveys of the impacted neighborhoods, in others neighborhood petitions were accepted by City officials. If funds were not available for particular traffic calming measures that budget year, a short range capital programming document incorporated those improvements in subsequent years.

Selected Elements Appropriate to San Francisco

The City of San Francisco currently has two citizen groups that are actively involved in promoting improvements in bicycle facilities and usage. The San Francisco Bicycle Coalition (SFBC) and the City's Bicycle Advisory Committee (BAC) are established organizations that can be very useful in promoting traffic calming measures.

In addition, the development of the Comprehensive Bicycle Plan provides an opportunity for the establishment of specific goals to increase bicycle usage within the City. These goals and objectives are being incorporated into the Transportation Element of the City and County Master Plan, which is currently being revised. If approved by the Planning Commission and the Board of Supervisors, they would become citywide goals and objectives, as well.

However, with the exception of the "*San Francisco Bicycle Facility Improvement Program*", there are no specific procedures that a neighborhood group could follow in pursuing the implementation of a traffic calming program for their neighborhood, other than letters to City departments and presentations to the Board of Supervisors or selected commissions.

Recommended Implementation Steps for Traffic Calming in San Francisco

The following traffic calming implementation process is based upon some of the more successful approaches that have been used in the cities mentioned earlier. This particular list of actions is designed to elicit as much information as possible early in the process such that if a neighborhood is not totally behind traffic calming recommendations, efforts can be halted without an excessive outlay of public funds. This recommended step by step procedure draws heavily on the experiences of Seattle and Portland bicycle planners.

Step 1: Community Outreach - Following the completion of the Comprehensive San Francisco Bicycle Plan, the Bicycle Coordinator's Office will distribute the results of the Plan, i.e. route maps and proposed projects, to neighborhood groups and bicycle enthusiasts. In addition, the process for requesting consideration as a future site for traffic calming improvements will be included, i.e. this process. This distribution could possibly be aided by the use of advertising material and/or combination mailings with other public agencies.

The City should employ the services of established citizen's groups to develop community support on a grass roots level to interest neighborhood groups in requesting consideration for traffic calming improvements. For example, providing grant funding to such groups would be a cost-effective way to extend staff resources to educate the public about the benefits of traffic calming and solicit public input on the specific strategies that would/could be employed in the neighborhood.

Step 2: Project Request - The Coordinator's office will be designated as the recipient of the first request for consideration as a potential site for a traffic calming improvement, or a larger request to consider analysis of the entire neighborhood's needs. The Coordinator's office will review the consistency of this request with other existing and proposed City plans, i.e. the Transportation Element, Transit Preferential Streets Program, Emergency Preparedness Plan, and the Pedestrian Streets Program.

Step 3: Preliminary Review - The Coordinator's office will prepare a checklist that summarizes the potential advantages and conflicts of the request. The Coordinator will present the results of this preliminary review to two standing committees that will review these requests on a quarterly basis: the Bicycle Advisory Committee and the newly established Bicycle Plan Implementation Technical Advisory Committee. This new committee should be composed of selected San Francisco public agency representatives that can contribute to this evaluation and implementation. Suggested representatives would come from the Department of Parking and Traffic (DPT), the Department of Public Works (DPW), the Public Transportation Commission (PTC), the San Francisco County Transportation Authority (SFCTA), the Recreation and Parks Department, MUNI, the Police Department and the Department of City Planning.

These two committees will either accept or reject the Coordinator's initial screening of the proposed traffic calming request. If an individual or neighborhood association is denied further consideration by both of these committees and the Coordinator's office, they will have the opportunity to present their proposals to the Parking and Traffic Commission. The Commission will have the final say as to whether the proposed request/project receives further consideration.

Step 4: Priority Rankings - Project requests are ranked on an annual basis. The project rankings are based on the checklist of project advantages and disadvantages that were established by the Coordinator's office in the previous step. The number of project requests that are ranked highly will depend upon the number of requests that are received that year and the funds available for the program.

Project rankings are generally based upon how the project will impact the following concerns:

- i. Does the project reduce traffic volumes, and if so, to what level?
- ii. Does the project reduce speeds?
- iii. Does the project reduce accidents?
- iv. Does the project encourage alternative transportation modes, i.e. bicycle and walking?
- v. Does the project impact a school setting where increased vehicular safety is required?
- vi. Does the project impact other uses that have high requirements for pedestrian or bike access, such as senior housing, park facilities, or youth centers?
- vii. Does the project correspond with a designated bike diversion or pedestrian route?
- viii. Does the project have low traffic diversion impact on surrounding streets in the neighborhood?

If a project receives a low ranking for more than 3 or 4 years, it is automatically dropped from the program, following a notification to the individual or neighborhood that originally requested the project. The original petitioner can, of course, appeal this elimination to the Commission, or resubmit the project at a later time.

Step 5: Survey to Proceed - Given that a project has received a high ranking and funds are available to implement the project, a brief postcard survey is prepared and distributed to the impacted neighborhood. This survey is designed to evaluate the level of support that the project has within the community, before significant planning or engineering work is begun.

This postcard survey is mailed to each household, business and nonresident property owner within the impacted neighborhood. For the City of Portland, the impacted area was defined as those properties fronting on the affected segments of the project street. When a project only impacted one intersection, the survey would be sent to all properties within a one block radius of the intersection. However, it should be noted that if the project causes significant traffic diversion, then the streets parallel to the traffic calmed street could also be negatively affected by increased traffic and should also be surveyed.

To defer the costs of this survey, Portland requires that the original petitioner be responsible for circulating the survey. If a majority of the impacted properties support the project, the request then moves to the next step.

Step 6: Public Meeting - Using the same mailing list that was utilized in the survey, and expanding upon it to include the full neighborhood, other interested parties, city bureaus, etc. a public meeting notice is then distributed. The purpose of this first public meeting is to inform the public of the project and to solicit input as to potential alternatives or revisions to the project.

Step 7: Establish Project Citizens Committee - Depending upon the size of the project, rather than holding a series of large public meetings, a volunteer citizens committee, that agrees to meet for a few months as the project is defined, is established. This limits the cost of notifications for a public meeting, although the time and place of the citizens's meetings are still carried in neighborhood publications.

The purpose of this citizen's committee is to work closely with staff to define the project. Specifically the group will:

- a) Assess the problems and needs to be addressed by this project;
- b) Identify project goals and objectives;
- c) Identify evaluation criteria that will be used to review the success of the project;
- d) Develop alternative approaches/plans/ costs for the proposed project; and
- e) Select the final recommendation.

Step 8: Project Development - Working with the citizen's committee, DPT/DPW staff will finalize the project's design and implementation schedule. Cost estimates will be prepared. Following the completion of this work, a final public meeting will be held. Issues associated with any necessary enforcement or education efforts required for the project's successful implementation will be addressed.

Lastly, this step will determine if the citizen's committee wishes to conduct a demonstration project prior to final engineering and full construction of the project.

Step 9: Demonstration Project - A demonstration project should be conducted to determine the impact of the project prior to incurring the costs for full construction. For example, rather than construct a full concrete traffic circle, barriers could be used for a specified period of time.

Within the City of Portland, a second petition is circulated within the impacted area to determine if a demonstration project should be conducted. Again, the original petitioner is responsible for collecting signatures for the demonstration petition. If a majority of the impacted area's properties do not support the demonstration, the project is stopped at this point.

Demonstration projects normally last for approximately 3 to 4 months. This allows the City's engineering staff to review any potential problems that might arise from the project. In many cases a temporary demonstration project is not required, for example street signage or striping. In such cases the costs would be the same whether the improvement was temporary or permanent; this step is therefore omitted for those particular projects.

Step 10: Project Evaluation - As mentioned earlier the citizens committee was responsible for determining what constituted a successful project. The development of evaluation criteria has proven to be a very successful tool in assessing the future use of a particular traffic calming measure and to determine if a proposed improvement should be uniformly implemented throughout the entire neighborhood.

Evaluation criteria are usually based on reductions in the number of vehicles passing a particular point, or counts as to the increase in bicycle usage. Reductions in both auto and bicycle accidents is also a potential criteria. Measurement of before and after speeds/volumes and the impacts on emergency vehicle access is also analyzed.

Following the operation of the traffic calming measures for the selected demonstration time period, the evaluation criteria are applied. Results of this evaluation are reviewed with the citizens committee, property owners and appropriate city departments.

At this point the City is responsible for deciding whether the project should move into final design and construction.

Step 11: Confidential Ballot - Following a successful evaluation, the City of Portland's procedures require a confidential ballot, which the City administers. Although this step could be eliminated based on the scale of the project, Portland has found it a useful tool in determining the neighborhood's support of a project prior to moving into final design and construction.

Step 12: Final Design, Construction, Implementation and Monitoring - The next steps of the project should result in the construction and implementation of the project in a fairly short time period. Because these previous efforts have included such a high level of citizen involvement and participation, the project should be implemented within a fairly short time period. This is particularly true in light of the fact that key property owners could change over a long implementation period and new property owners might request that the entire

effort be repeated. Most traffic calming measures within the Seattle and Portland programs are completed within one year.

Project monitoring, however, is a process that goes on for 3 to 5 years. For the City of San Francisco, it would be appropriate for DPT to continue to monitor a project and distribute their findings at the Technical Advisory Committee meetings that were proposed early in this recommended list of steps.

Miscellaneous Recommendations

This recommended step-by-step community based process for implementing traffic calming measures assumes that a number of other factors are in place to support these efforts. Issues that are of particular importance to the City of San Francisco include the following:

Adequate Budget - This program assumes that once a project is highly ranked and the process of surveying the neighborhood and conducting public meetings has begun, adequate budget exists to implement at least the most highly ranked projects. The neighborhood representatives would very quickly lose interest if, after extensive community involvement, the program was not funded for that year. Therefore, to really ensure that this effort is viable, it might be appropriate to begin only after several years of capital funding was established.

Adequate Staff - The level of effort required to initiate and maintain such a program requires more than one full time Bicycle Coordinator. The City of Portland currently maintains a staff of two full time bicycle planners and Seattle has five full time positions.

Multi-Departmental Cooperation - The proposed technical advisory committee is only one element of the multi-departmental cooperation that would be required for this effort. Not only would there have to be a willingness to provide staff support and review for new projects, but other departments would also be involved with on-going monitoring and evaluation of the projects.

Grass Roots Citizen Support - The proposed recommendations have no chance for success unless there is support from the neighborhoods. To initiate this support many bicycle groups have become involved in their neighborhood groups and formed the nucleus for many of these grass roots traffic calming requests. The San Francisco Bicycle Coalition's current goal of increasing membership by 150 percent is well timed to support these efforts.

In summary, all of these elements should be in place prior to the initiation of an aggressive bicycle oriented traffic calming program. However, as other cities have shown, the benefits from such an effort can be significant, further increasing both the quality and safety of urban living.



7. BICYCLE PARKING, BUILDING AND TRANSIT ACCESS

BICYCLE PARKING ISSUES

INTRODUCTION

The shortage of on-street automobile parking in San Francisco, the enforcement of regulations designed to prevent undesirable parking and to fairly apportion available parking, and the high cost of off-street parking are a source of endless frustration to motorists and a perennial topic of conversation and newspaper articles. They may even discourage a certain number of automobile trips. Lack of secure bicycle parking is an even greater deterrent to bicycle travel, since bicyclists need more than a space to park the bicycle. They need facilities that can also provide security against theft, vandalism, and weather.

While children's and inexpensive adult bicycles may have kickstands, most high-quality bicycles lack kickstands because they are ineffective and heavy, and because the bicycle must be locked to a fixed object for security. Thus a bicycle parking facility should also support the bicycle without damage or the threat of its falling. Many common bicycle racks fail this test.

Theft of high-quality bicycles is a serious problem in San Francisco. These profitable thefts are committed by professional thieves with skill, motivation, and sophisticated tools. The August 1994 issue of *Bicycling* magazine describes the activities of professional bicycle thieves in San Francisco, who cruise the streets in vans armed with arsenals of lock-breaking tools, and deliver the stolen bicycles to central points where they are stripped, repainted, and sold or transported elsewhere for sale. (See Appendix F.)

Lacking convenient and secure bicycle parking, determined bicyclists will make do with what they can find—street signs, parking meters, lampposts, even trees. These alternatives are undesirable for the bicyclist, because they may be substantially less secure; for pedestrians, because they may interfere with their movement; and for the City, because they can create liability or damage street furniture or trees. Regulating the time, place, and manner of bicycle parking is discussed in Chapter 8 under "City Ordinances and Traffic Law."

Bicycle parking facilities that are conveniently located and adequate in both quantity and quality can help to reduce bicycle theft and to eliminate inappropriate parking, benefitting everyone. Bicycle parking is highly cost-effective compared to automobile parking, and if credits are given for auto parking, the building owner can benefit as well.

REVIEW AND ANALYSIS OF EXISTING PARKING REQUIREMENTS

Zoning ordinances in most cities require the provision of extensive automobile parking with the construction or renovation of buildings. However, where automobile parking is required, it is no more than a matter of equity to require bicycle parking as well. In fact, in areas that are exempt from providing automobile parking, bicycle parking is even more necessary. In addition, the parking requirements of the zoning ordinance do not apply to small business owners or commercial districts in the neighborhoods. Other programs are needed to provide bicycle parking in these areas and are discussed later in this chapter.

This section examines San Francisco's existing requirements for bicycle parking. Recommendations are given to amend the planning code so that bicycle parking is provided in all needed locations and to optimum design standards.

The San Francisco Planning Code Bicycle Parking Requirement and Guidelines

San Francisco Planning Code §155(j) requires that all new developments provide one bicycle parking space for each twenty off-street automobile parking spaces provided. These requirements are checked by the Building Inspection Division (against the plans approved by the Planning Department) before a certificate of occupancy is issued. A deficiency of this policy is that it does not address the need for bicycle parking at locations or buildings where no off-street automobile parking is required. It should be amended to require bicycle parking at all new developments whether or not automobile parking is required, as discussed further in this chapter under "Quantity". In addition, as with ADA requirements, existing developments within San Francisco should be required to retroactively provide bicycle parking except in cases of demonstrable hardship.

The City has guidelines specifying the definitions of various classes of bicycle parking, the division of parking among classes, recommended bicycle rack designs, and placement standards. These guidelines are found in two documents, "Bicycle Parking Requirements" and "Bike Rack Placement Criteria" (see Appendix F), but have not been incorporated in full into the Planning Code. This approach provides valuable flexibility, as long as the guidelines are enforceable through the zoning compliance process. It is recommended that the Planning Code be revised to require that these guidelines, or as amended, be followed.

The following paragraphs expand upon the issues addressed in these guidelines. Recommendations are given regarding the definitions of bike parking facilities, the quantity of bicycle parking and the issue of short-term vs. long-term parking. Location and other design criteria as well as recommended bicycle parking types are addressed later in this chapter.

Facility Types - The San Francisco guidelines define two types of bicycle parking facilities:

- Class I facilities protect the entire bicycle and its components and accessories against theft, vandalism, and weather. Examples are lockers, check-in facilities, monitored parking, restricted access, and storage in a building in view of the owner.

- Class II facilities are racks that permit locking the bicycle frame and one wheel with a U-lock (a heavy but theft-resistant locking device), and that support the bicycle without damage to wheels, frame, or components (which excludes many traditional types of racks).

These definitions correspond closely to those in the guidelines of the League of American Bicyclists, and the City of Santa Cruz's bicycle parking ordinance. While some communities define Class II slightly differently, and may also define a Class III, definitions similar to San Francisco's are finding increasing acceptance since the advent and proliferation of the U-lock. San Francisco's Class II definition therefore seems appropriate, and there seems no need to define a Class III. But since even U-locks are vulnerable to sophisticated assault, it would be advisable for the City to search for, or to persuade manufacturers to produce, reasonably priced racks that accept and protect U-locks and are otherwise acceptable to bicyclists.

According to Appendix A of the Department of Parking and Traffic's "Bicycle Parking Requirements," (found in Appendix F), the San Francisco Bicycle Advisory Committee (SFBAC) recommends three styles of Class II rack: the inverted U, the ribbon rack, and the hanging triangle. The inverted-U and the ribbon rack are inexpensive to buy or fabricate and to install, support the bicycle well, and can be used with U-locks. The inverted U provides the best support but accommodates only two bicycles, one on each side. The illustration for the ribbon rack in this appendix shows a bicycle parked parallel to it, but in fact this rack is designed to accommodate as many as seven bicycles parked perpendicular to it. (Ribbon racks accommodating varying numbers of bicycles are available). Used in this way, however, it provides support at only one point. Since user behavior varies, the capacity of such racks is unpredictable. The third recommended style, the large hanging triangle or coathanger type, provides both reasonable support and high capacity, thus is appropriate only in locations where parking for eight or more bicycles is desired.

Manufacturers now offer a variety of unusual rack styles, and bicyclists' tastes differ. It may make sense for San Francisco to consider new styles of racks as their effectiveness becomes known from the experience of other cities or locations.

Quantity - The San Francisco Planning Code requires one bicycle parking space for every 20 off-street automobile parking spaces.⁽¹⁾ No off-street auto parking is required for most types of development in downtown San Francisco and within neighborhood commercial districts. Thus often, bicycle parking is not required either. A more accurate method would specify bicycle parking requirements according to the type of land use. This approach would also provide a method to require bicycle parking even where off-street auto parking is not required, which should be the case. For instance, a school or a commercial recreation facility has a greater need for bicycle parking than an animal care facility or an auto service center. In addition, the ratio of employees to visitors, and therefore of long-term to short-term parking, can also vary according to use.

⁽¹⁾ San Francisco's requirement is greater than that of some cities; the City of Los Angeles, for instance, requires one bicycle parking space for every 50 automobile spaces. Palo Alto, on the other hand, for most uses requires one bicycle space for every 10 automobile spaces, and Davis requires three bicycle spaces for every 10 automobile spaces. Other cities require bicycle parking as a function of floor area or number of employees. Los Angeles County requires four bicycle parking spaces for the first 50,000 square feet of non-residential development, and one space for each additional 50,000 square feet or fraction. Pasadena requires three spaces for every 200 employees, and Irvine requires three spaces for every 250 employees.

Davis and Santa Cruz require bicycle parking according to type of land use, and the League of American Bicyclists (LAB) has developed guidelines for 14 different land-use types. The L.A.B., Davis, and Santa Cruz requirements are shown in detail in Appendix F.

In order to better match supply to demand, San Francisco should also adopt bicycle parking requirements based on type of land use, similar to these models. The requirements should apply to any new building, addition to or enlargement of an existing building, or change in use of a building.⁽²⁾ The number of spaces required should be modified to match local needs and be politically acceptable. Initially it is recommended to adopt the guidelines developed by LAB for a community with a bicycle commute rate similar to San Francisco's. The ideal outcome would be to always have a slight excess of bicycle parking spaces.

In addition, the bicycle parking requirements should include the following features:

- For small installations, a minimum number of spaces—two or four.
- A provision that would allow building owners to replace up to 10 percent of automobile parking with bicycle parking in excess of the requirement. One automobile space can usually accommodate six bicycle spaces.
- A capacity requirement waiver for larger installations, allowing a development to install fewer bicycle spaces than required, with the remainder kept in landscaped reserve, to be converted to bicycle parking when monitoring demonstrates a demand.

Short-Term and Long-Term Parking - Most bicycle parking ordinances divide the required parking between long-term parking (a full working day or longer) and short-term parking (a few minutes to a few hours). Long-term parking is typically used by employees or residents, has low turnover, and requires a high level of security. Short-term parking is typically used by visitors or customers, has a higher but variable turnover (depending on use), should be conveniently located, and requires a lower level of security.

Class I parking is considered high-security and it should be provided for long-term parking. The most common form of Class I parking is the bicycle locker. To ensure availability, lockers normally operate with a key, and are usually provided on a monthly basis or longer. Whether or not there is a charge for auto parking, there is usually a fee for lockers and almost always a key deposit. Lockers are therefore unavailable to the occasional user and are not suitable for short-term parking.

In many buildings, employees are permitted to bring bicycles into individual offices. This approach provides an effective and inexpensive substitute for lockers. Unlike physical facilities, however, its availability depends on the continuing cooperation of the building owner and tenants, and the City cannot easily enforce compliance. Additional discussion on the appropriate use of the various types of Class I facilities is presented under Implementation and Design Guidelines.

⁽²⁾ For consistency, it is recommended to use the Planning Code's definition of Significant Expansion and Change of Use.

Class II facilities offer lower security than Class I, but they are more suitable to high turnover, and their security is adequate for short-term parking. Security can be improved dramatically by locating the racks in public view.

San Francisco's current guidelines (see Appendix F) state that at locations where long-term parking is expected to dominate, such as business offices, hotels and motels, and residential units, at least half the parking must be Class I facilities. This ratio is consistent with the requirements of other jurisdictions such as Palo Alto and Santa Cruz, shown in Appendix F.

RECOMMENDED BICYCLE PARKING POLICIES

As discussed previously, lack of bicycle parking at one's destination is a severe deterrent to using the bicycle as transportation. The previous discussion on bicycle parking requirements addressed the bike parking needs at new developments or areas that are subject to the planning code requirements (or could be if the planning code is indeed imposed retroactively). However, there is a chronic lack of bicycle parking at the myriad of existing buildings and attractions in San Francisco. This section reviews existing City practices and makes recommendations for how and where the City should provide bicycle parking at such existing locations. Design and implementation guidelines for the various types of bicycle parking are also presented. Funding recommendations were presented in Chapter 4.

Retail Districts and Activity Hubs

For retail districts and activity centers or developments in areas where businesses or landlords are not individually responsible for off-street parking, the City should install on-street bicycle parking. Such locations generally are retail districts like Castro, Geary and Polk Streets, or large city-owned areas such as Golden Gate Park. These areas generally have a large demand for short-term bike parking.

A few years ago, the City installed a number of racks on sidewalks in various locations. At the time, there were no guidelines regarding placement that would guarantee pedestrian and handicapped circulation, which caused some logistical problems. Since there has been a City Bicycle Coordinator and a BAC, there are now bicycle placement criteria, which address sidewalk encroachment concerns and liability issues. (These will be discussed later in this chapter).

Under an existing program, in effect for about one year, the City will install bicycle racks in the public right-of-way at a business' request. The property owner, however, must fill out a substantial amount of paperwork, including a detailed map and a liability waiver, and pay an encroachment permit processing fee of \$50 to the Department of Public Works, plus an \$11 recording fee. This program, which places the burden for the request on the individual property owner, has not been effective, resulting in only one application.

In contrast, the City of Chicago identifies locations for bicycle racks and installs them on its own initiative. Over 1,500 racks have been installed in the last two years. The City of Seattle provides free installation of racks at the request of business and property owners through its Spot Improvement Program. In July 1993, Seattle received 80 percent Federal matching funds to purchase additional racks, and installed these racks wherever the city's bicycle program determined

there was a need in the downtown area, in business districts, and along arterials. The Seattle program is described in Appendix F.

San Francisco should adopt a policy similar to that being used in Seattle and Chicago. By actively installing racks at locations of its own choosing, the Department of Parking and Traffic can both provide a sufficient supply of bike racks and ensure compliance with placement criteria. If the lead is taken by the Department of Parking and Traffic, most of the paperwork and cost associated with processing it would be eliminated. Businesses should be actively solicited to identify rack locations, but should not be responsible for paperwork, waivers, or fees. Bicycle parking will benefit both the small business owners and their patrons who will now be able to bicycle to these locations.

It is recommended that this program be extended to both bicycle parking in the public right-of-way and in the private off-street parking lots of existing businesses, including supermarkets, super drugstores, retail stores, shopping malls, etc. This would be consistent with the intent of the bicycle parking requirements of the Planning Code and would ensure that at least minimal bicycle parking is available as a public policy. It may be appropriate for the City to ask larger business owners to share in the cost of the procurement and installation of the racks, rather than requiring them alone to bear the responsibility of retroactively imposing the zoning requirement. It is acknowledged that staffing is needed to oversee and implement such a program. In order to ensure that the racks, particularly on sidewalks, are installed correctly so as not to interfere with pedestrians, transit passengers, merchants concerns, etc. the design and location guidelines discussed later in this chapter should be followed.

Specific recommendations for bicycle parking locations have been developed but not approved by the SFBAC. (A list is contained in Appendix F). This list is not meant to imply that other locations are not worthy of priority treatment. Reference should be made to the recommended policies in this chapter to develop a comprehensive bicycle parking program for the City of San Francisco. Reference should also be made to the section on Design Guidelines when acquiring and installing the parking facilities at these locations.

Recommendations for obtaining funds to purchase racks were offered in Chapter 4. The cities mentioned above have used a variety of funding sources including ISTEA-CMAQ.

City-Owned Garages

Currently, four of the 15 City-owned garages provide bicycle racks in the view of the attendant: Civic Center (20 racks), Sutter-Stockton (7 racks) 5th and Mission (33 racks), and Golden Gateway (13 racks). The racks at the first two garages are in view of the attendant. The price is 25 cents per day at the first three garages and free at Golden Gateway. The racks at 5th/Mission garage were installed too close to the wall to be effectively used.

All City-owned parking garages should provide bicycle-parking for at least 4 to 10 bikes, depending on expected initial demand. If the racks are regularly used to capacity, additional bike racks should be installed. The location of bicycle parking in garages should be advertised through a variety of techniques including but not limited to press releases, on city bicycle maps, notices at bike shops, notices to tenants of downtown buildings, through the City's transportation coordinator, downtown parking maps, billboards, and sidewalk placards, etc. Signing on the outside of the garage entrances should be installed to notify bicyclists of the racks. Appropriate fees are discussed in a later section.

The fact sheet on City-owned Parking Garage Rates prepared by the Department of Parking and Traffic should be updated to indicate whether bicycle parking is provided in each garage and what the parking fee is, if any.⁽³⁾

The City should consider a joint cooperative effort with BART to provide bike lockers at City garages closest to the downtown BART stations. Currently, BART commuters using these stations have no bike parking facilities available to them. Providing space in City garages for BART-supplied lockers would be convenient for commuters from North Beach, Pacific Heights, etc., whose closest BART stations are Embarcadero and Montgomery Street Stations. These bike lockers also would be attractive to bike commuters who work downtown.

The City should take the initiative to work with BART for the provision of bicycle lockers downtown.

Privately-Owned Garages

The City should adopt a policy to encourage bicycle parking in all privately owned garages, in the amount of 1 percent of the total number of automobile spaces. The criteria for bicycle parking placement and rack design should conform to the guidelines set forth later in this chapter.

Building Access

Currently many building owners arbitrarily refuse to allow bicycles into their buildings. This includes many buildings owned and/or leased by the City of San Francisco for its own employees. This adversely affects many potential bicycle commuters, as many do not feel secure leaving a bicycle that can cost up to \$1,000 or more in a rack. Even if the rack is in a visible location, many components and accessories of the bike, (pump, water bottle, light, odometer, seat, wheels, etc.) can be easily pilfered. Thus, bicycle access to one's office is often the only parking alternative that some cyclists would consider 100 percent safe.

Building managers' concerns are primarily the perceived negative opinion of other tenants, perceived maintenance costs from bicycle grease, and fire safety regulations. These concerns are often in direct proportion to the marketability of the space. As the experience of numerous companies has demonstrated, if bicycle access to a building is made a condition of signing a lease, these concerns disappear. If credits toward automobile parking are given toward Class I bicycle parking requirements, building owners can also benefit from allowing bikes inside.

City Owned Buildings

Bicycles should be allowed in City owned buildings unless alternative Class I parking is available for employees. Acceptable locations should be specified by the individual departments and subject to safety regulations and available space.

⁽³⁾ The March 1994 version indicates only that the Sutter-Stockton garage has bicycle parking.

To serve the visitor or the non-employee, the City should also provide indoor bicycle racks at all buildings that receive visitors. Bikes parked at indoor racks are much less vulnerable to theft of either the entire bike or its components. City Hall and the Hall of Justice currently provide indoor racks within view of a security guard or an attendant. Initially, one rack with a capacity for a minimum of three bikes should be installed. If it is regularly used to capacity, additional bike racks should be installed. If secure bicycle parking is not provided at or near the building, the City should allow visitors to bring bicycles into City buildings and employees to park them inside at locations specified by the individual agencies, and subject to safety regulations and available space.

Building owners and tenants in other states have also used innovative approaches to accommodate bikes inside buildings and/or near the bike owner's office. In one design, a bike hangs from the ceiling from both wheels in the owner's own office. A second design accommodates a bank of bicycles along a wall that hang from the ceiling by only one wheel. A third approach, used in Texas, was to install rustic wooden bike racks along a wall which has been painted with a mural of trees along a bike path. The real bikes seem to be part of the mural. Other examples of indoor parking facilities are shown in Appendix F. Creativity inspired by local conditions can result in numerous other innovative solutions for bicycle parking.

Privately Owned Buildings

The City should require all new and renovated buildings to set aside space for indoor bicycle parking. Several examples of indoor parking facilities are shown in Appendix F.

The City should adopt a policy that leases for commercial buildings cannot deny tenants the right to bring bikes into their leased space. Requests for exceptions to this policy should be made to the Department of Parking and Traffic, and allowed only if the building owner provides another type of Class I facility within the building such as check-in parking, monitored parking or restricted access parking. If a new building will provide building access, credit towards meeting Class I parking requirements of the parking ordinance should be granted. Class II requirements would still need to be provided for visitors.

In the interim before building access is universal, the City of San Francisco should not lease any buildings for City employees unless bicycles are allowed access into the buildings.

Major Employment Sites Outside the CBD

The responsibility for providing parking at non-City owned locations such as hospitals, universities and employment sites should fall to the property owners and employers. While new buildings will be subject to the zoning ordinance, existing locations should be encouraged to abide by the intent of the ordinance. Incentives and benefits to employers will be explored further in Chapter 10, in discussing bicycle promotion programs for city employers. The bicycle parking facilities at these locations should still conform to the bicycle design standards and placement criteria if applicable.

Major Events

In the past, private bicycle organizations such as the San Francisco Bicycle Coalition, East Bay Bicycle Coalition, and the Silicon Valley Bicycle Coalition have provided free valet bicycle parking at public events, using inexpensive equipment such as portable fences, portable racks, and cables.

These events have included the Landscape Garden Show and the Blues Festival at Fort Mason, A la Carte A la Park in Golden Gate Park, and various street fairs in San Francisco; World Cup soccer at Stanford University; and Festival at the Lake in Oakland. The City should require organizers of large events to provide similar parking, either on their own or by contracting with local bicycle organizations.

Innovative Parking

In a dense urban area like downtown San Francisco, there are many opportunities for innovative bicycle parking projects. Minneapolis provides a bicycle garage, in the form of a trailer that offers free indoor valet parking. If mobile, such a trailer could also provide bicycle parking at large public events such as festivals, sports events, concerts, and conventions. It might be publicly owned and rented to clients for a moderate fee; or city bicycle parking requirements for such events could provide a strong incentive for privately owned trailers to fulfill the need.

There may also be a market for larger facilities, either public or private. Three quarters of Dutch intercity rail stations provide large guarded bicycle parking garages; the median capacity is about one thousand bicycles. The parking is a combination of sheltered racks and lockers. Many locations in Europe offer guarded bicycle parking, sometimes in conjunction with repair and rental services. Japan and the Netherlands—both densely populated countries—have automated bicycle parking carousals, which allow storage of a large number of bicycles in a small space while preserving security. Projects such as these may be impractical for individual employers, but it might be efficient for a number of downtown businesses to satisfy their bicycle parking requirements by sharing the cost of the facility. Other potential locations for large guarded bike parking facilities are: near the Embarcadero BART station (to serve both downtown workers and BART commuters), Civic Center, Union Square (to serve both downtown workers and downtown shoppers).

RECOMMENDED BICYCLE PARKING IMPLEMENTATION AND DESIGN GUIDELINES

Class II - Freestanding Racks

Bike racks, Class II parking facilities, should be provided at locations where the user needs parking for two hours or less.

As mentioned previously, "Bicycle Parking Requirements" prepared by the SFBAC is used by the Planning Department as the guidelines to satisfy Section 155j of the San Francisco Planning Code regarding the provision of bicycle parking. This document defines Class I and Class II bicycle parking facilities. Many cities officially adopt such definitions in a parking ordinance, but more flexibility is retained by using the Planning Code as described earlier.

The City can either have a policy that only certain approved racks can be used, or can develop specific design criteria for the racks themselves. Both approaches are recommended so that there is consistency throughout the City, and so that exceptions can be allowed in order to accommodate rack designs that are in character with the historical context of certain buildings or areas.

Appendix A to the above referenced document recommends three specific rack designs. Design specifications are provided only for the Rail type rack. Specifications should be adopted for the remaining two types of racks, the Ribbon rack and the Hanging Triangle rack. Two variations of the Ribbon rack that deserve consideration are:

- 1) The inverted U, either singly or in tandem, and
- 2) The Bicycle Rib Series II, which is essentially a ribbon rack but instead of uniform spacing between the vertical components, smaller spacing alternates with larger spacing (the upside-down U areas are close together and the U-shaped areas are further apart - see Appendix F).

The document *Bicycle Rack Placement Criteria* addresses the physical location of bike racks on the public sidewalk. In addition, *Bicycle Parking Requirements*, Section 2, Location, addresses such issues as minimum area required by racks, and guidelines for the location of bicycle parking (such as in highly visible areas, near the building entrance, minimum aisle width, standards for the size of parking spaces, barriers to prevent damage, paving, signs, etc.) These should be formally adopted as design and location standards in order to ensure the rack's proper placement on the public right-of-way, particularly sidewalks, to protect the City from liability. The City should prepare additional guidelines addressing the following placement and design issues:

Minimum Rack Height - To increase visibility to pedestrians, racks should have a minimum height of 33 inches or be indicated or cordoned off by visible markers.

Location and Access

- For Class II parking, there must be a clearance of 24 inches between adjacent bicycles and 18 inches from walls or other obstructions.
- Facilities intended for employees should be located near the employee entrance, and those for customers or visitors near the main public entrances. (Convenience should be balanced against the need for security if the employee entrance is not in a well-traveled area.)
- There must be convenient access to the facilities. Where access is by a sidewalk or pathway, curb ramps must be provided where appropriate.
- Bicycle parking should be clustered in lots not to exceed 16 spaces each. Large expanses of bicycle parking make it easier for thieves to operate undetected.
- Paving should be required.

Signing - Bicycle parking areas must be identified by a sign at least 12 inches square. The sign must give the name, phone number, and location of the person in charge of the facility. Where Class I parking is provided by restricted access, the sign must state that the enclosure must be kept locked at all times. Where bicycle parking areas are not clearly visible to approaching cyclists, signs must direct them to the facility.

Lighting - Lighting of not less than one foot-candle illumination at ground level must be provided in all bicycle parking areas.

Placement of the Hanging Triangle Rack - This rack design is intended to be used from both sides; when placed near a wall its capacity is reduced by half. This type of rack should be placed a minimum of 7 feet from a parallel wall.

Frequency of Racks on Streets - In popular retail areas, one rack holding a minimum of two bicycles should be installed on every block. Since the theft of components is so common, bicyclists will not leave a bike very far from the store in which they are shopping. To determine the best location on the block, it is a good idea to observe where bikes are now parking, make postcards available to the public and to the merchants so they can submit suggestions. A copy of the postcard Seattle uses is in Appendix F.

Locations Within Parking Garages - Provide bike racks within the view of the attendant. Bike racks should not be placed immediately adjacent to the street, where components would be susceptible to pilfering.

Locations Within Buildings - Provide bike racks within 50 feet of the entrance. Where a security guard is present, provide rack behind or within view of a security guard. The location should be outside the normal flow of pedestrian traffic.

Locations Within a Campus-Type Setting - Racks are useful in a campus type setting at locations where the user is likely to spend less than two hours, such as near classrooms. They should be located near the entrance to each building. If racks are clustered in a single location, they should be surrounded by a fence and watched by an attendant. The attendant can often share this duty with other duties to reduce or eliminate the cost of labor being applied to the bike parking duties. (See discussion on next page). For the long term parking needs of both employees and students, attendant parking and/or bike lockers are recommended. A cheaper alternative to an attendant is to have a fenced bicycle compound in a highly visible location on the campus.

Class I - Bicycle Lockers

Lockers are useful at locations where a regular bicycle commuter needs secure long-term parking. Due to past problems with vandalism and/or non-bicycle use of bike lockers, most providers of bicycle lockers have abandoned the purchase of coin-operated lockers and only provide lockers on a monthly rental basis. There is almost always a key deposit and sometimes a monthly fee as well. This type of arrangement works well for the regular bicycle commuter who can plan ahead and is willing to pay the fee.⁽⁴⁾ Reserved lockers also have the advantage of assuring the bicycle commuter that there will indeed be a secure space for his/her bicycle, rather than discovering on arrival that all the lockers have been taken. However, reserved lockers do not address the needs of

⁽⁴⁾ Many bicycle commuters are willing to pay the fee, because, in addition to their bike, they can store helmets, clothing and other paraphernalia. Lockers are even popular at college campuses. At California State University-Sacramento, they are available on a first come-first serve basis, and are rented for \$10 a semester, (even though there is a free attended bicycle parking compound).

those bicyclists who need secure all-day parking on a less than daily basis. Other Class I parking should be available for such a user.

Lockers are recommended at transit stations, parking garages or parking lots without attendants, and park-and-ride facilities. This recommendation does not imply that these locations should not provide other types of parking facilities such as other Class I facilities for the sporadic user, racks for the short-term user, etc.

Class I - Attendant Bicycle Parking - Monitored or Check-In

Attendant parking is practical where there is a heavy demand for secure bicycle parking. College campuses and high schools are obvious locations, as are employment locations with a large commuter bicycling population. When the bicycle attendant can be shared with another use, such as garage attendant, security guard, or even better, a private bicycle maintenance and repair operator, this becomes more cost-effective. Lastly, large events are prime examples where attendant parking can serve the demand that is an occasional, not daily, phenomenon.

Transit stations are other locations where attendant parking would fill a void. There is a chronic shortage of bicycle lockers at BART stations for instance. Lockers are also unavailable to the occasional BART user. This will be addressed further in a later section.

Indoor Bicycle Parking - Hybrid of Class I and II

Indoor bicycle parking is appropriate in a number of circumstances. At locations frequented by a population that will ride regardless of weather, like universities and colleges, bike parking in existing garages provides protection from the elements. In areas like downtown and Civic Center, bike parking in existing garages provides an increased level of security for the Class II parking for the short term. Indoor parking can be provided for 2 or 3 bikes at a time and increased as demand warrants, as discussed under Building Access. Thus, it does not have to be a big commitment of space or funds.

BICYCLE PARKING FEE STRATEGY

The ultimate objective of the San Francisco Bicycle Plan is to improve bicycling conditions in San Francisco in order to increase the number of trips made by bicycle. The availability of secure and convenient bicycle parking is a significant factor in encouraging the use of the bicycle. This section will explore the appropriate parking fees for the bicycle parking facilities outlined above.

The lack of auto parking or the cost of parking often deters residents and visitors from using their car within San Francisco. In the same vein, the lack of secure and convenient bicycle parking often discourages the bicyclist from using a bicycle for daily commute and shopping trips. With that in mind, the approach to bicycle parking fees should be to make them as attractive as possible to the bicyclist.

Class II

Class II bicycle parking facilities or unenclosed bike racks represent a minimum of security to the bicycle and for most bicyclists are appropriate for only a few hours. Bicycle parking located within view of a parking attendant is more attractive but the attendant or parking vendor is not responsible for loss or damage to the bicycle and may not always be able to "keep an eye" on them. Lights, water bottles and other equipment can be easily and quickly stolen.

Currently, four city-owned garages provide unenclosed bicycle parking; sometimes in view of the attendant. At three of the garages the cost is 25 cents per day, and at one garage it is free. This may seem like a nominal charge compared to the cost of parking a car in the same lot.

When considering appropriate parking fees the following questions must be asked:

1. Does the parking program provide an improved service to the bicyclist?
2. Will the parking program encourage more bicyclists?
3. What are the benefits to the City from increased bicycle use, i.e. reduced pollution and congestion, as well as do these benefits offset the cost of providing bicycle parking and do they warrant the subsidy of parking fees?

The direct cost (materials and labor) of providing Class II bicycle parking is approximately \$120 per bike space. If the bike rack must be placed in an auto parking space, there may be additional costs associated with loss of parking revenue. Nevertheless, to encourage bicycling and to keep bicycles from being locked to trees and posts and creating a nuisance to pedestrians, Class II bicycle parking should be provided free, whether the rack is provided on the street, in a city building or in a parking garage.

Class I

Class I or enclosed parking facilities are more expensive to provide but are significantly more secure than bike racks. Although many bicycle commuters would be willing to pay a nominal fee to guarantee the safety of their vehicle, Class I bicycle parking should be free where automobile parking is free.

In much of San Francisco, especially Downtown, automobiles are charged for parking. If automobile parking has a fee, one method of determining an appropriate fee for Class I bicycle parking is to make a comparison between automobile capital costs and auto parking costs. For example, assume it costs \$15/day to park a car worth \$15,000. By that token, an equitable cost to park a bicycle worth \$500 would be \$0.50/day in a downtown area where there is a significant automobile parking fee. In this example, this translates to \$125/year. However, to encourage the use of bicycles for commuting, yearly fees for bicycle parking should probably not exceed \$80 (\$7/month or \$0.25/day). This maximum fee should only be charged when the cost of providing Class I parking indeed costs \$5/month per bicycle. If the costs of providing Class I parking are less, the fees should also be less.

Another method would be to pro-rate the bicycle parking fee based on the space a bicycle occupies compared to an automobile. This would result in bicycle fees approximately one-tenth that of automobiles. It is recommended, however, that bicycle parking rates should encourage bicycle use, thus one -twentieth of the automobile fee is recommended, if a fee is charged at all.

Special Events

Special events in San Francisco can cause a great deal of traffic and parking congestion. As part of the event advertising, participants are encouraged to use public transit and, often, transit routes are realigned and supplemented to handle the increased patronage. Event sponsors are responsible for costs incurred by the event for additional policing and trash collection as part of the event permit process. To relieve the impact of traffic and parking congestion, event sponsors should also take an active role in promoting bicycling to the event by being required to provide enclosed valet bicycle parking as part of receiving an event permit. Bicyclists should be encouraged to use the valet parking, thereby removing the obstructions to pedestrian flow created by bicycles locked to trees and posts.

Currently the San Francisco Bicycle Coalition provides free valet bicycle parking at many events. Event sponsors should take on the responsibility of providing this service or contracting with local bicycle organizations. To encourage the use of valet parking, it should be made available at no cost or on a "donation" basis.

SUMMARY OF PARKING RECOMMENDATIONS

In summary, the City should take the following steps to provide and improve bicycle parking:

- Revise the planning code requirements for bicycle parking so that parking requirements corresponds to land use rather than the number of auto spaces provided.
- Amend the Planning Code to refer to the Bicycle Parking Guidelines.
- Identify locations for public bicycle parking and install parking facilities in these locations.
- Adopt a policy of providing bicycle parking in City-owned garages, and for or inside City buildings.
- Adopt a policy that major event sponsors must provide attended bicycle parking in order to receive a permit.
- Adopt a policy that building owners cannot deny tenants the right to bring bikes into the building unless other Class I parking is provided.
- The City should require all new and renovated buildings to set aside space for indoor bicycle parking, both Class I and Class II.

- Credit for required Class I parking should be given for allowing bicycles building access.
- Revise location guidelines to include additional elements such as clearance, convenient location, paving, signage, access, and lighting.
- Adopt a provision that would allow building owners to replace up to 10 percent of automobile parking with bicycle parking in excess of the requirement. One automobile space can usually accommodate six to ten bicycle spaces.
- Allow a capacity requirement waiver for larger installations, allowing a development to install fewer bicycle spaces than required, with the remainder kept in landscaped reserve, to be converted to bicycle parking when monitoring demonstrates a demand.
- Work with BART to provide bicycle lockers in city garages adjacent to downtown stations for reverse commuters.

TRANSIT ISSUES

TRANSIT AND BRIDGE ACCESS REVIEW

Introduction

The integration of bicycle and transit use on both a local and regional basis enhances the role of each mode in providing convenient transportation options. It is essential in maximizing the bicycle's transportation utility for medium range trips.

The Bay Area, with San Francisco as its transit hub, presents many geographic barriers to bicycle access. San Francisco is surrounded by water on three sides. The core of the Bay Area is surrounded by a ring of significant hills. Bicycle access on transit vehicles connecting San Francisco to other areas (for both utilitarian and recreational trips), includes bicycles on buses, rail vehicles, ferries, and shuttles.

Much progress has been made in the last several years to improve bicycle access on transit in the Bay Area, at the urging of various bicycle advocacy groups. Programs and policies for bicycle access on transit vehicles connecting San Francisco to other areas have been expanded in recent years. However, the San Francisco Municipal Railway (MUNI) still does not have any provision for bicycle access on its vehicles.

This review of transit and bridge bicycle access summarizes discussions with planners at transit agencies that operate in San Francisco and contains information from their literature. Information from a San Francisco Bicycle Coalition survey of Bay Area and several U.S. transit agencies is also included. This survey was conducted in April 1994 to learn about their bicycle rack programs. Their

findings showed that the various bicycle access programs were successful and that initial perceived problems were overcome.

Bus Bicycle Access

Although MUNI does not accommodate bicycles, three bus transit operators connecting San Francisco with other counties do. They allow bicycles inside buses on a space-available basis at the driver's discretion. A description of each bus system's bicycle policies is presented below. Sections in quotes are from the operator's literature. These policies are also summarized in Table 7-1.

MUNI (San Francisco County) - Bicycle access is not included in any of MUNI's planning documents. However, MUNI's Service Planning Department has expressed interest in installing bicycle racks on the 76-Marin Headlands route.⁽⁵⁾ The 76-Marin Headlands operates on Sundays and holidays across the Golden Gate Bridge between the San Francisco CalTrain Station and the Golden Gate National Recreation Area in Marin County. A particular concern specific to this recreational route is potential excess demand for bicycle-accessibility on the last bus back to San Francisco, since typical front-mounted racks only hold two bicycles. This could possibly be overcome by allowing bicycles inside the buses if there is enough room. Ridership data suggest that this may be the case.

Another potential candidate route for bicycle access is the 36-Teresita which serves a very hilly area on Mount Davidson and has low ridership. However, it uses 30-foot coaches that have less capacity than standard 40-foot coaches, and it often operates at capacity at school arrival and departure times.

MUNI has several concerns about bicycle access. One is the need for modifications to any bus that would result in that vehicle having to be assigned to a specific route. The Transit Workers' Union (TWU) would probably be concerned about whether the racks could be easily removed from the buses. They may also have concerns about being responsible for an extra task, such as dealing with bicycles. There are also concerns about carrying bicycles on board buses. One concern is that after boarding bicycles, enough additional passengers could board en route so that the bus became too crowded to accommodate bicycles on board. Another is leaving the decision about whether to allow bicycles on board up to the driver's discretion, as this could vary from driver to driver. Approvals for a bicycle program would have to be obtained from the maintenance and transportation departments and the General Manager.

SamTrans (San Mateo, San Francisco and Santa Clara Counties) - Bicycles are allowed in the front area of buses *"as long as the cyclist is able to load and unload the bike quickly and without assistance."* The cyclist must be at least 16 years old. Bicycles must be unloaded *"when a wheelchair or elderly passenger requires their space or when the bus is 50 percent full."*

AC Transit (Alameda, Contra Costa and San Francisco Counties) - According to AC Transit's literature, bicycles are allowed only on Routes NZ, 65, and 67. Routes 65 and 67 do not serve San Francisco, but operate between downtown Berkeley and Tilden Park in the Berkeley Hills. However, AC Transit Board Policy No. 408 (June 1993) states that *"Non-folding bicycles shall only*

⁽⁵⁾ Telephone conversation with Duncan Watry, MUNI Service Planning Department, February 1995.

Table 7-1

**CURRENT BAY AREA TRANSIT POLICIES
San Francisco Bicycle Plan**

Transit Agency	Bicycle Access Policy	Permit/ Fees	Other Restriction
MUNI	No access.	N/A	---
SamTrans	Bicycles allowed if the bus is less than 50% occupied.	None	Two bicycles per bus, seniors and wheelchair passengers have priority, bicyclists must be at least 16 years old.
Golden Gate Transit	No access, except Route #40, San Rafael to Richmond line.	None	Two bicycles per bus, wheelchair and disabled have priority, bus must not be full.
AC Transit	No access, except certain buses on Lines 65 & 67 to Tilden Park and all buses operated between 12:30 AM and 5:00 AM. These late night buses include Lines F and NZ to San Francisco. Folding bicycles always permitted on all buses.	None	Passengers have priority for seating areas, wheelchair passengers have priority.
CalTrain	Weekends, holidays all trains are accessible. Only trains marked with a "B" in timetable (non-peak period) are accessible weekdays.	Free permit now valid indefinitely	Up to 12 bicycles on designated trains, only in cars with bicycle decal.
BART	Bicycles allowed, except traveling in commute directions during peak hours. Cannot use 12th or 19th Street Oakland stations during peak periods.	\$3.00 for 3-Year Permit	Bicycles allowed only in rear section of last car. Bicyclist must be at least 14 years old or accompanied by an adult. Folding bicycles allowed on all trains.
Golden Gate, Red & White, and Blue & Gold Ferries	Bicycles allowed. Ferries operate to Alameda, Oakland, Sausalito, Tiburon, Vallejo and Larkspur.	None	---
Caltrans Bay Bridge Bike Shuttle	Operates at 45-minute headways during peak periods only between MacArthur Park BART and Transbay Terminal	Fare is \$1.00 each way	---

Wilbur Smith Associates; February 1995.

be permitted on buses between the hours of 12:30 PM and 5:00 AM." This means that bicycles are also allowed on Route F between San Francisco and Berkeley/Albany after 12:30 AM and on several East Bay trunk lines that operate all night.

Route NZ is the Bay Bridge owl service, operating between San Francisco and Oakland/San Leandro. It operates in a period when BART is not available in this corridor (12:45 AM to 5:30 AM). Cyclists *"must secure their two-wheelers with the seat belts designed for wheelchairs in the bus."* They *"are required to be in control of their bikes at all times and to keep bus aisles from being blocked. Passengers shall have priority for seating areas over bicycles. If a wheelchair passenger boards the coach, the wheelchair passenger has priority over the bicycle. Space permitting, the passenger may also roll the bicycle down the aisle to the rear of the bus and be seated."* Passengers with bicycles must keep *"at least one hand on the bicycle while the bus is moving. In no case is the bicycle to be allowed to remain in a position which blocks aisles, doors, steps, or emergency exits. Drivers are not to assist passengers with bicycles"*.

In the past, AC Transit carried bicycles on front-mounted bicycle racks on trans-bay Route T, connecting San Francisco, Treasure Island, Oakland, and Alameda. These racks were custom designed and built by AC Transit so that the buses could be washed without rack removal. Bicycle-accessibility was discontinued on this route because the Operations Department was not always dispatching coaches with racks and no complaints were received from cyclists. Before BART was built, Route B, between San Francisco and Oakland, had an internal bicycle rack on some buses, called "Pedal Hoppers." The bicycle racks were removed from Route B after BART began carrying bicycles.

The AC Transit Research and Planning Department⁽⁶⁾ has been studying the feasibility of adding front-mounted bicycle racks to AC Transit's trans-bay buses. This study was initiated as part of the Bay Bridge Congestion Pricing Project, a proposal to increase the peak-period tolls on the Bay Bridge. A small portion of the additional revenue generated is proposed to be used to fund the trans-bay bus bicycle racks. However, due to lack of political support, the Bay Bridge Congestion Pricing Project is now on hold.

AC Transit had pointed out several ongoing operational costs associated with a bicycle rack program, besides rack purchase and installation. These include the additional costs of washing buses with bicycle racks affixed and extra staff time needed for maintenance. Another operational cost consideration is that the trans-bay routes are not operated by dedicated buses. If enough racks were purchased to equip all trans-bay buses, these vehicles would have to be dedicated to the trans-bay routes. There is an additional cost associated with dedicating specific vehicles to certain routes. However, it appears that trans-bay bus running time would not have to be increased. Only certain pickup points are proposed for bicycles (such as major intersections and locations with hilly topography).

AC Transit staff may consider the installation of bicycle racks on trans-bay buses if a source of funding could be secured. There is some support for bicycle racks among staff. However, the obstruction of headlights by the racks and the bicycles is still a major concern. If the bicycle community is vocal in demanding bicycle racks on trans-bay buses and funding can be secured, the

⁽⁶⁾ Telephone conversation with Patricia Broadbent, AC Transit Research and Planning Department February 1995.

Research and Planning Department believes that there is a good chance that a trans-bay bicycle rack program can be instituted.

Golden Gate Transit (San Francisco, Marin and Sonoma Counties) - Bicycles are allowed only on Route 40, which does not serve San Francisco. Route 40 is a recently created regional route connecting San Rafael in Marin County and the El Cerrito del Norte BART Station in Contra Costa County.

Bicycle patronage on Route 40 has been slowly but steadily increasing.⁽⁷⁾ Currently, approximately two to three bicycles a week are carried inside buses on this route. While drivers are instructed to report whenever a bicycle is carried, it is possible that not all drivers do this. No problems have been reported. To date, there was only one occasion that a bicyclist had to take a bicycle off the bus due to a wheelchair boarding.

Since April 1994, bicyclists have been urging Golden Gate Transit to install bicycle racks on Route 80 (San Francisco to Santa Rosa). Bicycle access on this route is important because it would fill the last missing link in bicycle-accessible public transit from Monterey County to Mendocino County. Golden Gate Transit first evaluated whether bicycles could be carried directly on board the buses. After a ridership study, they concluded that passenger levels precluded on-board access. Staff has investigated three types of racks, but has not selected a preferred type.

The Golden Gate Transit Planning Department has requested that San Francisco, Marin and Sonoma Counties each use \$20,000 of the county's share of Transportation Development Act (TDA) Article 3 bicycle funds to purchase and install bicycle racks on Golden Gate Transit buses serving Routes 80, 40, 63 and 65. However, at this time, only San Francisco County has made a commitment to apply for TDA funds for this project. The failure to obtain funding from the three counties has precluded the implementation of a bicycle rack program. Golden Gate Transit does not expect to have a bicycle rack program in place soon. It will take time to secure funding and then implement the program. Golden Gate Transit staff believes that if the bicycle community is vocal in demanding bicycle racks on buses and funding can be secured, there is a good chance that a bicycle rack program can be instituted on certain routes. The Golden Gate Bridge Highway and Transportation District (GGBHTDE) Board of Directors has directed staff to follow up on cyclists' requests for bicycle access. They have not yet made bicycle-accessibility on buses an official board policy.

If racks are obtained, staff will install them on Route 80 (San Francisco to Santa Rosa) as the principal bicycle-accessible route. Racks would also be installed on Route 65 (weekend service between San Francisco and Inverness, including the Point Reyes National Seashore), and Route 40 (between San Rafael and the El Cerrito del Norte BART Station).

⁽⁷⁾ Telephone conversation with Alan Zaradnik, Golden Gate Transit Planning Department, February 1995.

Rail Bicycle Access

Two regional rail operators allow bicycles inside trains by permit only, subject to certain conditions:

CalTrain (San Francisco, San Mateo and Santa Clara Counties) - When the Southern Pacific Railroad Company operated what is now the CalTrain rail service (between San Francisco, San Jose and other intermediate South Bay stations), bicycles were not allowed, except during one six-month trial period.

In 1992 the Peninsula Corridor Joint Powers Board (JPB) took title to CalTrain. At the request of Peninsula Rail 2000 and the CalTrain Citizens' Advisory Committee, a sentence was included in CalTrain's Short Range Transit Plan that the JPB would start carrying bicycles once new rolling stock was delivered in 1994. This delay was not acceptable to cyclists, and after much lobbying of the JPB, a demonstration project was begun in September 1992. Four bicycles were permitted in the aisle on all weekend and holiday trains and selected off-peak weekday trains. Free permits were required to bring bicycles on the train.

Through the efforts of one dedicated cyclist, bicycle access has recently been expanded. In May 1994 the JPB removed some seats and installed special racks with securement cords in dedicated bicycle areas on 52 cars (two-thirds of the fleet), identified by a bicycle logo. This project was financed through Transportation Development Act Article 3 funds allocated to the City and County of San Francisco. It was a cooperative venture involving the JPB, Amtrak (the train operator), the San Francisco Bicycle Advisory Committee, the San Francisco Bicycle Coalition, and the San Francisco Department of Parking and Traffic. The cyclist who brought these parties together to achieve this result was awarded a Metropolitan Transportation Commission transportation award for his efforts.

CalTrain was supposed to receive 20 "California Cars", each with a three-bicycle capacity bicycle locker, in July 1995.⁽⁸⁾ However, due to manufacturing problems, this order has been delayed indefinitely. These new cars hold one less bicycle than the four that can be carried in the existing cars. The current cab cars⁽⁹⁾ do not have bicycle racks. Six of the 20 new cars will be cab cars with bicycle lockers. The total bicycle capacity of each train could increase, decrease or remain the same, depending on how the new cars are used. They could be added to existing trains to increase the total number of cars or used to replace existing cars.

Passengers with permits may now bring bicycles on board during off-peak periods. About 8,500 permits have been issued to date.⁽¹⁰⁾ The trains that allow bicycles are indicated by a "B" in the timetable. Since the rack installation, the number of trains allowing bicycles has steadily increased to 90 percent of all weekday trains. CalTrain management expects that all trains will allow bicycles by the summer of 1995.

⁽⁸⁾ Telephone conversation with Lawrence Thomas, Jr., CalTrain Citizen's Advisory Committee.

⁽⁹⁾ CalTrain operates in "push-pull" mode. The locomotive pulls the train southbound and pushes it northbound. The cab car is the car at the opposite end of the train from the locomotive. It contains an engineer's cab from which the train is operated in "push" mode.

⁽¹⁰⁾ Telephone conversation with Walt Stringer, CalTrain, February 1995.

As of January 1995, twelve bicycles (four in each of three cars) are allowed on 54 weekday trains and all holiday and weekend trains. In July 1995, it is expected that all 60 trains will allow bicycles. This program has been extremely successful. Some trains do not have enough capacity to meet the bicycle demand. On an average workday, six trains or 10 percent of the 60 total trains reach their capacity of 12 bicycles. The trains that are at their bicycle capacity are often reserve-commute trains. There have been reports that some cyclists that wish to board with their bicycles have to be denied access. However, the JPB has no plans to add additional racks or increase the number of cars of any of the trains. Cyclists would like to see additional funds obtained to retrofit more cars with racks so that more bicycles can be carried per train.

CalTrain management cites two issues that must be resolved before more bicycles can be allowed on the trains: cost and operational consequences. They want to get opinions from Amtrak and the cycling community concerning potential problems. These include boarding and alighting of additional bicycles, jockeying of bicycles in the rack (when the last bicycle secured is not the first one removed), and emergency access considerations.

Staff is currently considering changing the permits from a slip of paper to a more durable luggage-tag type permit or possibly eliminating the permit requirement. They expect to reach a decision by February 1995. Instituting a luggage-tag type permit could lead to a future permit fee, where the permit would be valid for two years. Existing permit holders would have to reapply for new permits under this plan. The cost of switching to this system would be approximately \$10,000, which would probably be defrayed by permit charges. Bicyclists favor the elimination of permits. CalTrain cites three reasons for permits: to inform cyclists of the rules, to have them sign a liability waiver, and to provide a reasonable enforcement mechanism. Without permits there would be a need to find another way to inform bicyclists of the rules. Changing the rail cars' bicycle decal to indicate a maximum of four bicycles per car is being considered. Some incidents have occurred between cyclists and conductors over the permit requirement and two cyclists have been arrested. It has been reported that some conductors are no longer checking permits. Some cyclists are considering suing CalTrain to force the abolition of permits based upon sections of the California Civil Code that entitles passengers to carry bicycles as luggage on common carriers.

The permit application lists various rules. The most significant ones follow. Bicycle space is available on a *"first-come first-served basis"* and *"conductors are unable to assist in boarding bicycles."* Cyclists must be at least 16 years old. *"Bicyclists must use the bungee cords to secure their bikes. Cyclists must stay near their bikes and closely attend them while on the train. Only single-rider bicycles are allowed. Bicycles must be kept clean and free of dirt and grease. Cyclists must be ready to board or detrain as soon as the train arrives at a station. The conductor . . . has the final authority with respect to the handling of bicycles on any given train. The conductor may refuse the transportation of bicycles due to crowded trains, condition of the bicycle, or unsafe conditions at his/her sole discretion."* Bicyclists cannot board until passengers exit the train.

A general CalTrain passenger survey was conducted in early November 1994, with 3744 responses. Thirteen percent of those who returned the survey indicated that they use the CalTrain bicycle-on-board program as part of their travel. Forty-three percent of all respondents said that they have not had any problems with this program and 38 percent did not answer this question. The most commonly cited bicycle-related problems in decreasing frequency of response were: inadequate bicycle capacity, conductor handling of bicycle program, adequate seating, adequate information,

bicycles in aisles, bicycles in vestibules, and "bicycle conditions." Eighteen percent said that more bicycle-accessible trains would enable them to use a bicycle as part of their CalTrain trip.

BART (Alameda, Contra Costa, San Francisco and San Mateo Counties) - The Bay Area Rapid Transit District (BART) has allowed bicycles on non-peak period trains since 1972. At one time, obtaining a permit was a very inconvenient process. Cyclists were required to apply in person with their bicycles at one of only two locations during limited weekday hours. Now, three-year permits can be obtained by mail or at BART's headquarters in Oakland for \$3.00. Temporary free one-time permits valid for up to three weeks are also available from all BART station agents upon presentation of a photo ID.

Bicycles are only allowed in the last car of each train. Bicycles are permitted between all stations during off-peak periods. They are also allowed on reverse-commute peak-period trips (from the San Francisco Embarcadero Station to stations on the Richmond, Concord, or Fremont lines in the AM peak-period and in the reverse direction in the PM peak period). During peak periods (6:30 AM to 9:00 AM and 3:30 PM to 6:30 PM, Monday through Friday), cyclists may not enter or exit the BART system at the 12th or 19th Street Stations in Downtown Oakland. Folding bicycles are always allowed and no permit is required. Cyclists must be at least 14 years old, or accompanied by an adult. Bicycles may be taken on elevators or stairs but not on escalators.

In 1992 BART proposed on-demand purchase of bicycle permits at stations, an increase in the permit fees to \$5, and state legislation (Senate Bill 1501) to authorize the BART police to fine cyclists up to \$250 for breaking any violation of bicycle rules. At the urging of bicyclists, the proposed authority of BART police to fine cyclists was removed from S.B. 1501. In 1994, in response to cyclists' concerns, BART agreed to form a Bicycle-Accessibility Task Force to work with BART staff.

The monitoring of the use of bicycles on BART trains and the review of any complaints are coordinated by a committee. It consists of BART staff from various departments and two representatives each from the San Francisco and East Bay Bicycle Coalitions. If a cyclist violates the rules issued with the permit, the permit may be revoked.

Other than the time of day restrictions, the most important rules, apart from those already mentioned, are: *"entrance and exit must be via primary station agent in multi-booth stations. No more than seven bicycles are allowed on each train. Cyclists must hold onto bike. If designated area is fully occupied, either with patrons or bicycles, cyclists on platform must wait for the next available train. At any time line personnel may refuse entrance due to crowded trains, platforms or unsafe conditions. Before boarding train, allow other persons to exit and enter. At no time should a bicycle block any portion of the train doors. In case of an emergency and evacuation is necessary, you must leave the bicycle on the train."*

Ferry Bicycle Access

Golden Gate Transit Ferries (San Francisco and Marin Counties) and Red and White Fleet Ferries (San Francisco, Marin, Solano and Alameda Counties) carry bicycles on board with no permits or additional fees.

Bridge Bicycle Access

Of San Francisco's two bridges, only the Golden Gate Bridge allows bicycling. On weekdays, from 9:00 PM to 3:30 PM the next day, and on weekends, from 9:00 PM to 5:00 AM the next day, cyclists use the east sidewalk. Before 9:00 PM, it is shared with pedestrians. On weekends between 5:00 AM and 9:00 PM and weekdays between 3:30 PM and 9:00 PM, they have exclusive use of the west sidewalk.

In response to bicyclists' requests, in 1992 the GGBHTD installed remote controlled gates at each end of the east walkway, previously closed between 9:00 PM and 5:00 AM. When a cyclist pushes a call button, a toll officer responds. The officer verifies that the call is from a cyclist via a camera and video monitor, and remotely opens the gate. After 15 seconds, the gate automatically closes. This project was financed through Transportation Development Act Article 3 funds allocated to the City and County of San Francisco. It has been a cooperative venture involving the GGBHTD, the San Francisco Bicycle Advisory Committee, the San Francisco Bicycle Coalition, and the San Francisco Department of Parking and Traffic.

There are no sidewalks on the 7-mile long Bay Bridge and bicycles are not allowed. However, bicycles are accommodated in this corridor at various times on BART, AC Transit, Red and White ferries as previously described, as well as on a Caltrans Bicycle Commuter Shuttle. The shuttle is a 12-passenger van that tows a specially built trailer with 12 bicycle racks. It operates nonstop between the Transbay Terminal in San Francisco and the MacArthur BART Station in Oakland only during peak commute periods on a 45 minute headway. The fare is \$1.00 each way. This shuttle is funded as part of the Bay Bridge operational budget.

ACCESS RECOMMENDATIONS

Bicycles are allowed on many large U.S. urban transit systems. The type of access, permit requirement, number of bicycles allowed, and other restrictions vary from system to system. A sample of some these bicycle access policies is shown in Table 7-2. Although bicycle access on transit vehicles presents many issues, most transit properties have reported good experience with these types of programs.⁽¹¹⁾ Although recent progress has been made in expanding the integration of bicycle and transit use, more can still be done.

Transit Access

The following actions are recommended to be taken by San Francisco to improve bicycle access:

- Work with representatives from the BAC, SFBC, and the Regional Bicycle Advisory Committee (REBAC) to help them in their ongoing efforts to improve bicycle access. The following specific improvements are of high priority to the bicycle community:

⁽¹¹⁾ Doolittle, John T. and Porter, Ellen Kret, *Integration of Bicycle and Transit, TCRP Synthesis 4, Transit Cooperative Research Program*, Transportation Research Board, National Research Council, National Academy Press, 1994.



Table 7-2
(Page 1 of 2)
BICYCLE ACCESS ON VARIOUS TRANSIT SERVICES IN THE UNITED STATES
San Francisco Bicycle Plan

City	Transit Agency	Bicycle Access	Permit Required?	Fee for Bicycle?	Maximum number of Bicycles	Other Restrictions
SF - San Jose	CalTrain	Inside	Yes	No	4 per train	Not permitted weekdays during peak hours.
Southern California	Metrolink	Inside	Yes	No	2 per rail car	At discretion of the conductor
	RDT	Inside	No	No	1 per bus	Not permitted during peak hours.
Sacramento	Regional Transit	Inside	Yes	No	1 per bus 2 per rail car	Not permitted weekdays 6-9A and 3:30-6P
New Jersey	North Jersey Coast or Raritan Valley lines	Inside	Yes	No	2 per train	Demonstration project 1993; only off-peak hours.
	Atlantic City Rail Line	Inside	Yes	No	5 per train	Demonstration project 1993; no time restrictions.
Seattle	Seattle Metro ⁽¹⁾	Rack-front. Total of 40 racks on 10 bus routes.	No	No	2 per bus	No loading/unloading in "ride free" (downtown area).
Sonoma County	Sonoma County Transit	Inside ⁽²⁾	No	No	3 per bus	Allowed in HC space on county-wide buses, not allowed on local buses.
Santa Cruz	Santa Cruz Metro District	Rack-rear: on 3 bus routes	No	No	4 per bus	---
Phoenix	Phoenix Transit	Rack-front	No	No	2 per bus	Entire fleet has racks, as of 1993.
San Diego	MTDB Trolley	Inside	Yes	No	---	Not allowed during peak hours.
	MTDB Transit	Rack-rear; on 4 bus routes	No	No	5 per bus	Can only load at certain bus stops.



Table 7-2
(Page 2 of 2)
BICYCLE ACCESS ON VARIOUS TRANSIT SERVICES IN THE UNITED STATES
San Francisco Bicycle Plan

City	Transit Agency	Bicycle Access	Permit Required?	Fee for Bicycle?	Maximum number of Bicycles	Other Restrictions
Santa Clara	SCCTD - Bus	Inside	Bus: No	No	2 per bus	At discretion of driver.
	SCCTD - Train	Inside	Train: No	No	4 per car	2 per car during peak hours.
SF Bay Area	BART	Inside	Yes	No	14 per car	Must be in rear car and are not allowed in peak direction during peak hours.
New York	Subway	Inside	No	No	No maximum	Bicycles are advised to avoid crowded trains.

- (1) Received federal grant (ISTEA-CMAQ) of \$950,000 to retrofit entire fleet of 1,000 buses with bike racks.
(2) Have one bike rack and are considering the purchase of additional racks as funds become available.

Wilbur Smith Associates; February 1995.

- ▶ **BART:** Retain the BART Bicycle-Accessibility Task Force as a permanent body. Allow bicycles in cars other than the last one. (Personal safety can be a concern in this car late at night and cyclists have to run to the last car when train lengths vary.) Consider the replacement of BART permits with an education and outreach program to inform BART users of bicycle-related rules. Expand bicycle access hours and consider a retrofit (similar to CalTrain) or modification of new cars to allow greater bicycle access.
- ▶ **CalTrain:** Eliminate permits, currently an option being considered by CalTrain. Also, see the action item below.
- ▶ **MUNI:** Some type of bicycle access. Also, see the action item below.
- ▶ **AC Transit and Golden Gate Transit:** See the action item below.
- The City's Bicycle Coordinator should actively pursue the following bicycle access policies on MUNI:
 - ▶ Install bicycle racks on buses so that the Sunday and holiday 76-Marin Headlands service across the Golden Gate Bridge can carry bicycles. The MUNI Service Planning Department has expressed an interest in seeking funds for this project.
 - ▶ Allow bicycles on board (space permitting) on 76-Marin Headlands and on lightly patronized neighborhood service in hilly areas of the City. The 36-Teresita serving Mount Davidson is a good candidate.
 - ▶ Allow cyclists with disabled bicycles (due to mechanical failure or accident) to bring them on MUNI vehicles, space permitting, at the driver's discretion. The BAC has suggested this and the MUNI Service Planning Department is willing to consider such a policy.
 - ▶ Encourage MUNI to include bicycle access in the next update of their Short Range Transit Plan and any other relevant planning documents. Bicycle access on all routes should be phased-in by installing bicycle racks on buses, as has been done in other major cities.
 - ▶ **Golden Gate Bridge:** See the action item in Bridge Access Section.
- Support bicycle access on all CalTrain trains, as proposed by their staff. Assist CalTrain in securing funding (such as TDA funds) to provide more bicycle racks on reverse commute trains that are already at the 12- bicycle capacity.
- Work with the bicycling community in encouraging AC Transit and Golden Gate Transit to install bicycle racks on all buses serving San Francisco and help them secure funding.

- ▶ AC Transit looked into this as a project to be funded by the increased tolls proposed in the Bay Bridge Congestion Pricing Study. Since state legislation for the toll increase appears unlikely, AC Transit's major constraint to implementation is the need to obtain funding.
- ▶ Golden Gate Transit staff has proposed installing racks on Lines 80, 63, 65, and 40 and has obtained two test racks. They are working on obtaining funding for this project.

Bridge Access

The following actions are recommended to be taken by San Francisco to improve bicycle access:

- Encourage Caltrans to increase the frequency and add additional East Bay pick-up points to the Bay Bridge Shuttle. Help them in securing funding. Caltrans looked into this as a project to be funded by increased tolls proposed in the Bay Bridge Congestion Pricing Study, but it was not included in the funding package.
- Encourage Caltrans to look into the long-term feasibility of making modifications to the Bay Bridge to allow bicycling on the bridge.
- Encourage and work with the GGBHTD to improve bicycling conditions and safety on the Golden Gate Bridge:
 - ▶ Improve the separation of bicyclists and pedestrians by allowing cyclists the use of the west walkway during more hours.
 - ▶ Investigate relocating the sheds on the west walkway to widen the clear space on the walkway.
 - ▶ Improve the current circuitous bicycle access to the west walkway on the San Francisco side of the Golden Gate Bridge and to the east walkway on the Marin side by providing more direct connections to local streets.
 - ▶ Build a higher protective barrier between the walkways and roadways on both sides of the bridge.

Publicity

Bicycle access on transit vehicles and bridges involves many varying rules, regulations, and restrictions. Access days and hours also vary by location and transit operator. Therefore, the following is recommended:

- Continue to update, publish, and distribute bicycle transit and bridge access information to bicyclists. Work with other agencies such as RIDES for Bay Area Commuters to coordinate efforts and avoid duplication. The brochure: *"Suggestions for Safe Bicycling and Bicycle Commuting,"* produced by the DPT and

BAC and "Bikes, Bikes, Bikes," produced by RIDES are two examples of this type of information.

TRANSIT AND BICYCLE PARKING REQUIREMENTS IN SAN FRANCISCO

Introduction

With the exception of walking to transit services, the use of bicycles provides the most energy efficient access available within a crowded urban area. In addition to supporting the City's air quality and congestion management goals, bicycle access to transit supports efficient land use objectives by minimizing the potential use of parking facilities adjacent to transit stations. Valuable vertical and horizontal urban space is preserved with the use of bike parking due to the fact that approximately 12 bicycles can be parked in the same space required by one car. This relationship is also true with regard to costs, in that the construction of a secure bike parking space is roughly 5 percent of the total cost of one structured parking space (\$500 versus \$12,000). Also, by biking to an existing transit facility, potential feeder bus service space is provided.

The City of San Francisco currently lacks sufficient bike parking facilities adjacent to transit access sites. San Francisco is far behind cities in Europe and Japan in the development and implementation of secure bicycle parking at transit stations. In addition to the lack of sufficient parking facilities, the City's transit providers have not supported the promotion or location of secure and safe bicycle parking facilities, much less the pursuit of bike related facilities adjacent to key transit access points.

This section will examine the key requirements of a good bicycle parking/transit access strategy. In addition, the advances that have been made in Europe and Japan will be discussed. Finally, this section will review the current bike parking facilities available at six major San Francisco transit hubs: CalTrain Station, Transbay Terminal, 16th Street/Mission BART Station, 24th Street/Mission BART, Glen Park Station, and the Balboa BART Station.

Bicycle Parking Requirements

The Bay Area's generally temperate climate, coupled with an excellent mix of regional rail, inter-city rail, light rail, cable car, ferry, electric trolley coach, and diesel bus service affords the City of San Francisco with excellent opportunities to combine bicycle access with transit use. The keys to successful bike access hinge on: First, an **accessible transit system** for bikes, and, second, the availability of **safe, secure bicycle parking facilities**. To maximize cost effective capital investments, the major focus of these bicycle parking improvements should be on the upgrade of parking facilities at the highest patronage stations. For downtown San Francisco, this applies primarily to the combined BART/MUNI subway stations.

In addition to this focus, other bicycle parking requirements and support features are as follows:

1. Bike parking should be **easily visible** so that the potential or casual bike rider knows that bike facilities are available at the transit station. Even when sight accessibility is not available, appropriate bike parking signage can be used at elevators, escalators and entrances.

2. The bike to transit trip is further enhanced with the location of **bike maintenance shops, stores or support facilities within easy access of the transit station**. Not unlike the location of a gas station or convenience store adjacent to a park and ride lot, these improvements can significantly encourage and maintain the bike to transit patron.
3. Bike lockers, or another form of guarded bike parking, should be **available on a daily basis**. Unlike most of the City's bike locker systems that require monthly locker fees and often have prohibitive waiting lists, some form of parking should be available on a daily basis to support the spontaneous decision to bike to the bus or rail system. This form of bike parking is often the impetus to develop a revised regular commute pattern. In addition, this form of bike parking supports that commuter who does not need a monthly bike parking space, but could use this form of transit for selected weekdays or weekends.

Europe and Japan: Bike to Transit Examples

The use of the bicycle has been maintained throughout the post World War era as a major form of transportation. Initially as a solution to the lack of post war fossil fuel production capabilities, and later as response to efficient land use development/transportation strategies, these areas of the world have developed sophisticated bicycle support facilities.

Currently in Japan, approximately 3 million bikes are parked daily at commuter rail stations. This volume represents an increase in bicycle usage of roughly 2,400,000 over 1975 estimates. Within Denmark, approximately 23 percent of the country's rail passengers destined for large city stations use bicycles to reach those stations. These estimates are even higher for inter-regional stations, 42 percent, and local rail stations, 44 percent. Within the Netherlands not only is the bicycle a key element at one trip end, but at both. Currently between 5 percent and 12 percent of the Netherlands' rail patrons also store a bike at the destination end of their trip.

These increases in bicycle usage to European and Japanese rail stations have been accompanied by a **significant capital investment in parking facilities**. Until 1978, bicycle parking at Japanese rail stations had been owned by private sector companies. However, the country instituted an effort to significantly expand bike parking from roughly 600,000 spaces in 1977, to 2.4 million by 1987. Currently, municipal ownership of bike parking at rail stations makes up 75 percent of all available bike parking, estimated at close to 3.5 million.

The average size of the bicycle parking facilities located at rail stations in Japan is significant. On average each station holds approximately 275 bikes, however, there are over 60 stations with 2,000 or more bicycle parking facilities. Most of the bicycle parking provided at rail stations in Japan is free, although approximately 10 percent of the facilities still charge user fees for prime locations immediately adjacent to the rail station entrance.

Within Denmark, bicycle parking facilities have been sized to accommodate the daily volume of transit users. Stations with over 5,000 daily boardings accommodate approximately 2,000 guarded bike parking spaces. Lower patronage stations, with between 2,000 and 5,000 daily boardings, have an average of approximately 800 guarded spaces. Large bike parking facilities are not the only types of guarded parking available within Denmark. Smaller stations offer free covered or open air

parking, often adjacent to special lock up areas reserved for regular patrons. Unlike the Japanese system, most of Denmark's guarded bicycle parking is managed by private firms, under contract to the railway.

In both areas of the world, bike repair and support facilities were either privately provided, adjacent to guarded bike parking or were part of facility itself.

San Francisco Bicycle Facilities at Major Transit Stations

The remaining portion of this section analyzes present bicycle parking conditions at six major San Francisco transit stations. This task included an assessment of current bicycle parking available at these facilities and the development of recommendations for improvement. The approach to this analysis included site visits and mapping of six transit station locations:

- ▶ CalTrain Station
- ▶ Transbay Terminal
- ▶ 16th Street/Mission BART Station
- ▶ 24th Street/Mission BART Station
- ▶ Glen Park BART Station
- ▶ Balboa Park BART Station

Conditions at each of the sites was assessed. This included counting the number, if any, of existing bicycle lockers or racks, determining the ease of access to the lockers/racks, and, assessing the viability, lighting, safety, and, comfort that the existing facilities provided. Next, the six sites were analyzed relative to their capabilities in meeting recommended design standards. Lastly, recommendations to improve the **existing** conditions have been set forth and long term recommendations are included in the last section of this subtask. It should be noted that the recommendations to improve existing bike parking facilities at San Francisco's transit stations is very conservative and represents immediate actions that should be taken. However, as facilities are redesigned and capital funds are made available, larger guarded and secure features should be added.

The inventory of bicycle parking at these San Francisco locations was conducted the week of July 11, 1994.

Background - Prior to beginning this review of the six major transit facilities in the City of San Francisco, the project team reviewed the current policies of the transportation systems serving them. The previous Table 7-1 summarizes current operational policies with regard to bicycle access on the transportation systems serving these facilities.

It should be noted in the remainder of this analysis that BART has a new policy regarding bicycle parking. Rack parking will no longer be provided at any BART station. This decision is based on the concern that only well secured bike parking will be installed to minimize the number of bicycle thefts and vandalism that has occurred at stations having only rack parking. The existing rack parking will remain at current locations but future capital investments will only be made in locker parking. It should be noted that this change in policy will reduce the flexibility that bike racks offer. Potential bike/BART passengers will be required to rent the lockers in advance on a monthly basis. It is recommended that BART rethink this policy as it will discourage a modal shift from auto to

bicycles if bicycle parking facilities are not available. BART should develop ways to make rack parking safer rather than relying solely on lockers for future capacity enhancements.

As might be expected the quality and availability of bicycle parking facilities was directly related to the access provided on the transit vehicles. A summary of the characteristics of all of the transit stations reviewed in this analysis is included in the following Table 7-3. A written description of each of the stations follows.

1. CalTrain Station - The CalTrain station is located south of Market Street at Fourth Street, between Townsend and King Streets. CalTrain is a 77-mile commuter service that operates 60 trains per day between Gilroy and the current San Francisco terminus located at Fourth and Townsend Streets. Approximately 16,000 people per day move throughout the station. Trains are operated generally with a 20-minute peak headway and a 45-minute mid-day headway.

The use of CalTrain by bicyclists is fairly common. CalTrain does, however, enforce strict rules regarding bicycle parking. There is a posted sign at the station which states that bicycle parking is only allowed in the designated racks or lockers, and any bikes parked elsewhere will be removed. The CalTrain Station currently has eight lockers, providing a total of 40 spaces, located along Townsend Street, near the corner of Fourth Street. (See Figure 7-1.) In addition there is a 16-space rack for bike parking located on King Street, near Fourth Street. At the time of this facility survey, there was a 16-person waiting list for the bike lockers and a requirement that lockers are rented for a minimum of one-month. No opportunities currently exist at the CalTrain station for secure daily bike storage facilities.

Although the quantity and location of lighting at the station is adequate, the safety of the vicinity in which the lockers is located is questionable. Currently there is an approximate 4-foot gap between the bicycle lockers and a chain-link fence that surrounds the train yard. This space is often filled with transients, discouraging most people from using the lockers.

Access to both the lockers and the racks was rated as fair. The area does have sufficient lighting, and was considered overall a fairly safe place to park a bike. However, the movement of cars and buses in and around the facility does not include any provisions for bicycle access.

Based on the project team's site visit, the recommended improvements to the site include the relocation of the existing bike lockers to a more hospitable site adjacent to Fourth Street. (See Figure 7-2.) This relocation would make the lockers more visible from the street and would minimize the use of the lockers by transients. An additional 24 bike lockers are also recommended for this site.

2. Transbay Terminal - The Transbay Terminal is located south of Market Street and is bounded by Howard, Mission, Beale, and Fremont Streets. Although the bus terminal is primarily used by AC Transit, the Golden Gate Bridge and Transportation District, SamTrans and MUNI also provide transit connections to the facility. Approximately 31,000 people access the facility today, served by 1,082 arrivals and departures per day. Bicycle parking at this terminal is not extensive.

Currently there are four bicycle rack parking spaces located in front of the ground level entrance. (See Figure 7-3.) On three site visits to the Terminal, all four racks were never full. The area surrounding the station is relatively safe and well lit. Station security guards patrol the terminal



Table 7-3

BICYCLE PARKING SURVEY SUMMARY
San Francisco Bicycle Plan

Location	Existing Parking	Number of Spaces	Number of Persons on Waiting List	Monthly Fee	Access-ibility	Lighting	Safety		Recommended Additional Parking
							Area	Traffic	
CalTrain Station	3 Racks	16	--	--	Fair	Fair	Fair	Poor	--
	Lockers	40	16	\$4.00	Good	Fair			24 Lockers
Transbay Terminal	1 Rack	4	N/A	--	Fair	Fair	Fair	Fair	--
	--	--	N/A	--					4 Lockers
16th & Mission BART Station	None	--	N/A	--	--	Fair	Fair	Fair	4 Lockers
24th & Mission BART Station	None	--	N/A	--	--	Fair	Fair	Fair	4 Lockers
Glen Park BART Station	1 Rack	4	--	--	Good	Good	Good	Good	
	Lockers	6	1	\$4.00	Good	Good			4 Lockers
Balboa BART Station	2 Racks	22	--	--	Good	Fair	Good	Good	
	Lockers	8	4	\$4.00	Fair	Fair			8 Lockers

Wilbur Smith Associates; February 1995

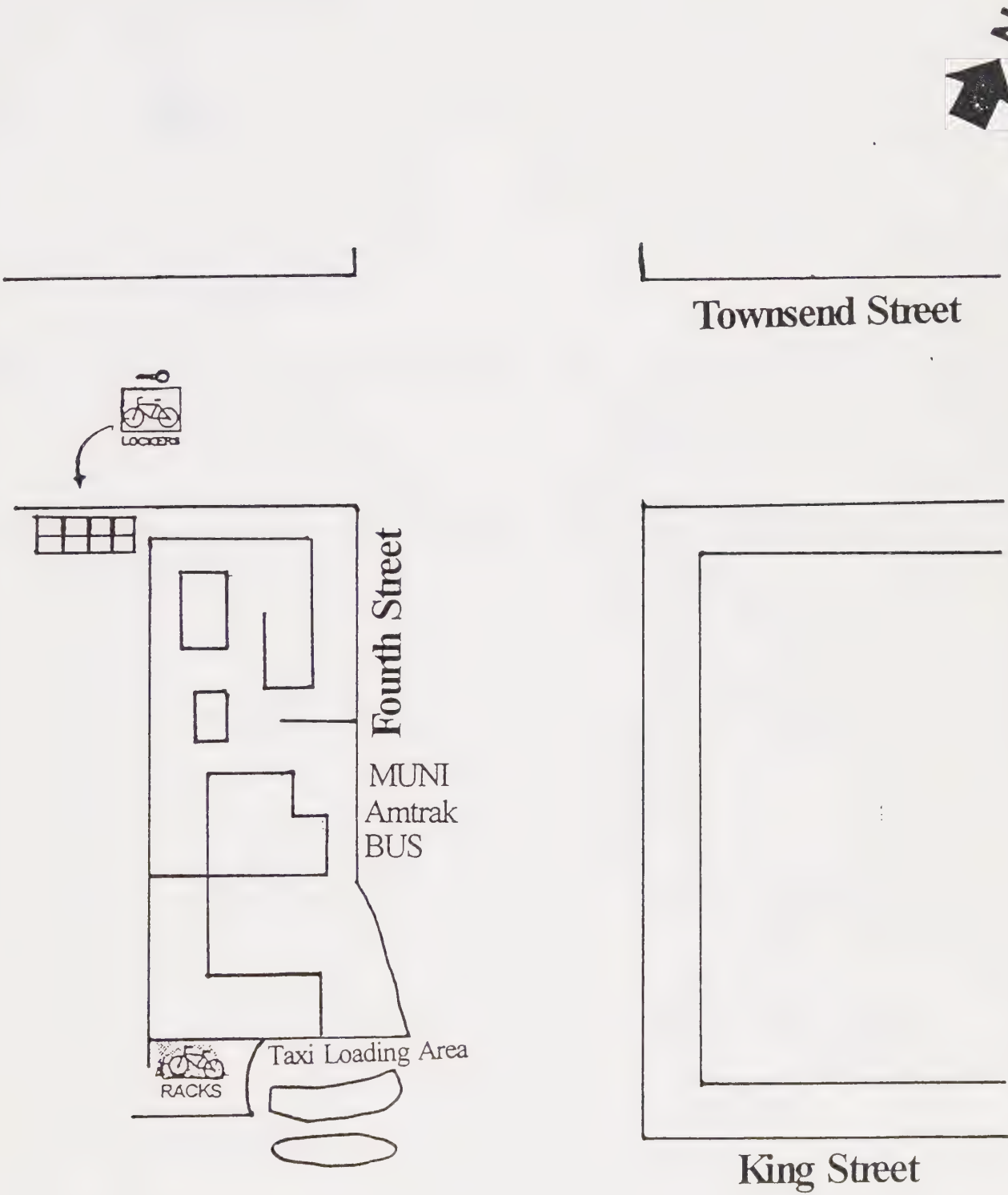
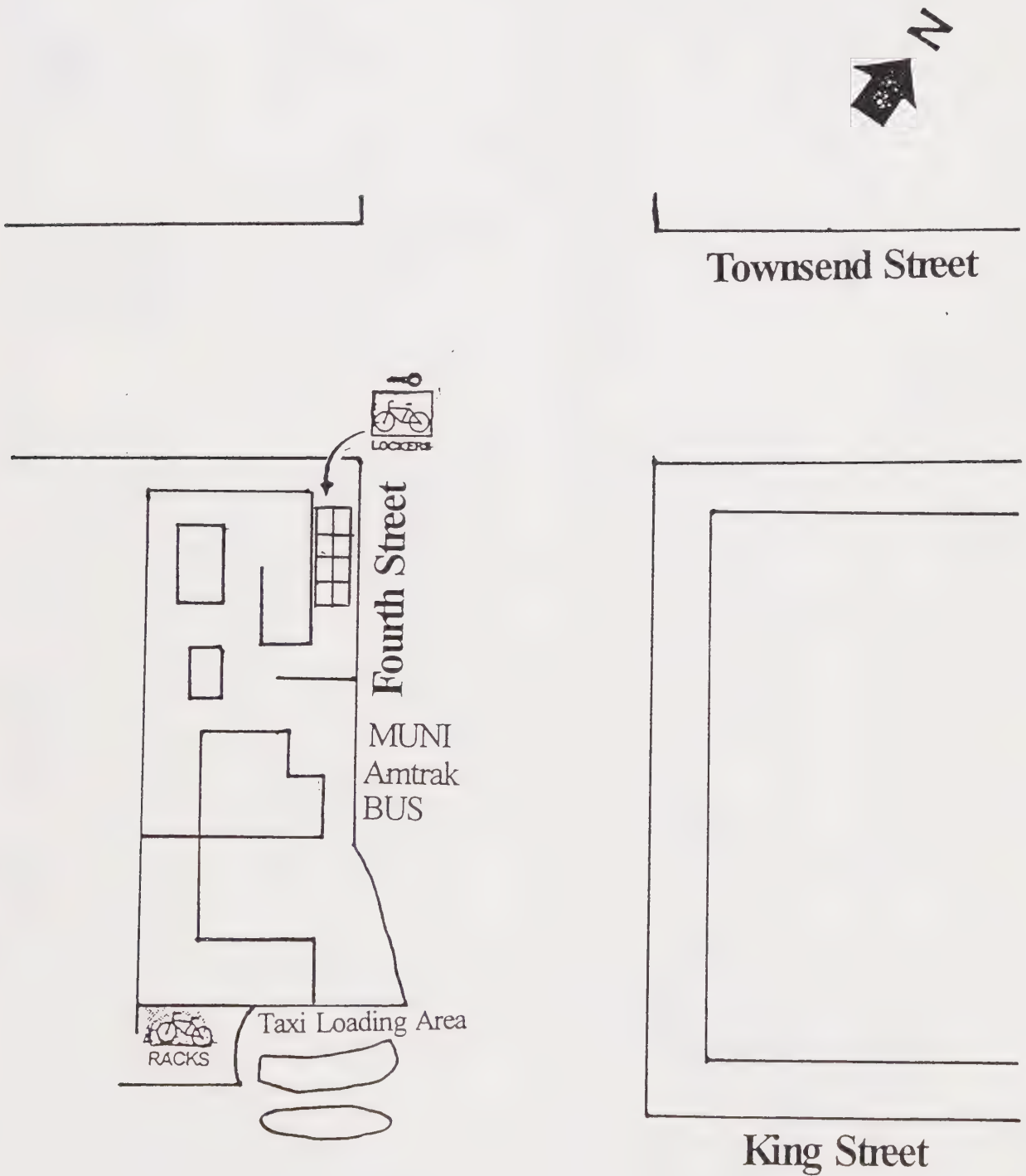
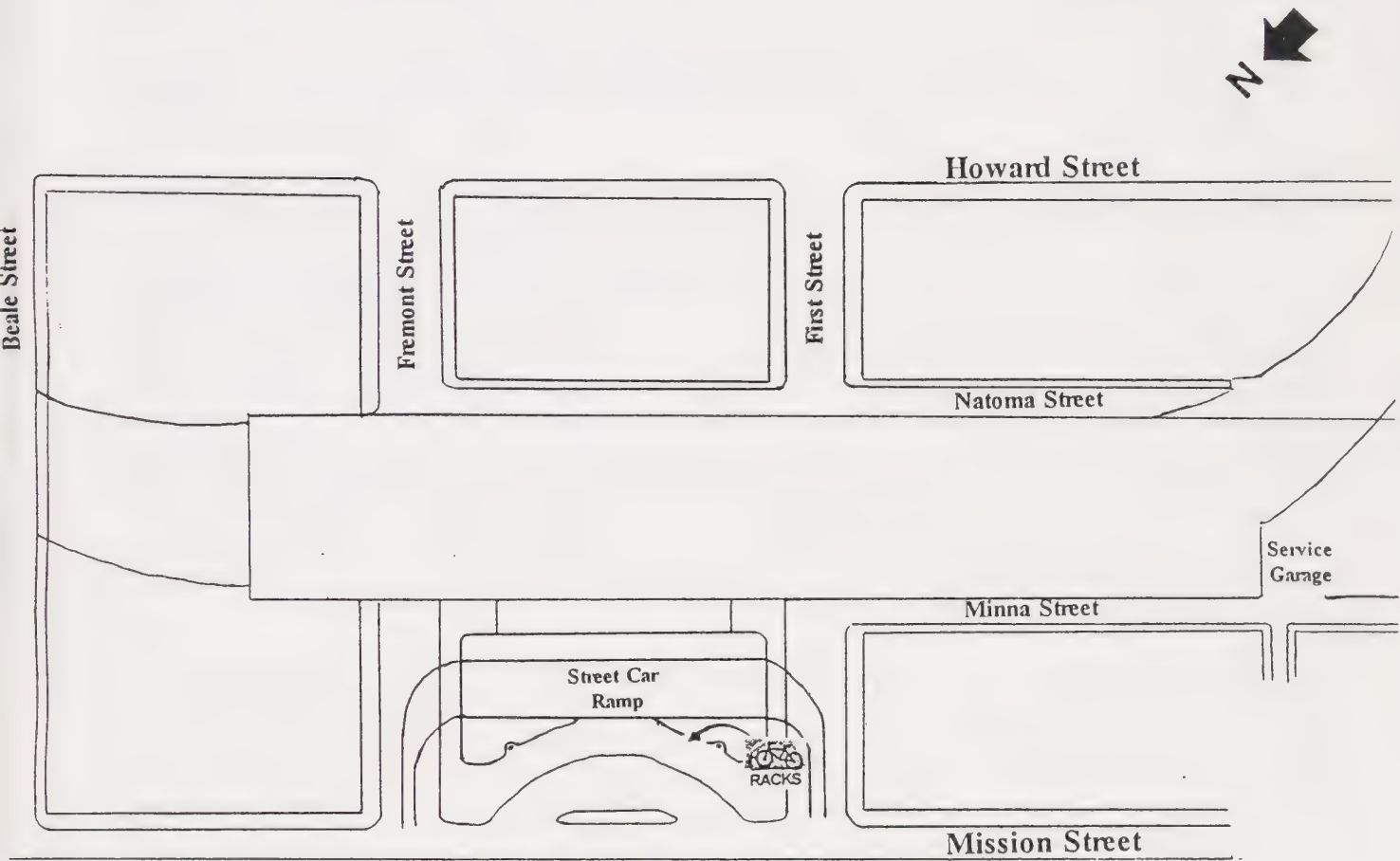


Figure 7-1





routinely. The downtown street grid and signal system allow fairly safe bicycle movements, although no bike lanes are located adjacent to the facility.

The recommendations to improve this facility include the addition of four bicycle parking lockers to be located in the vicinity of the curved access road off of Mission Street. (See Figure 7-4.)

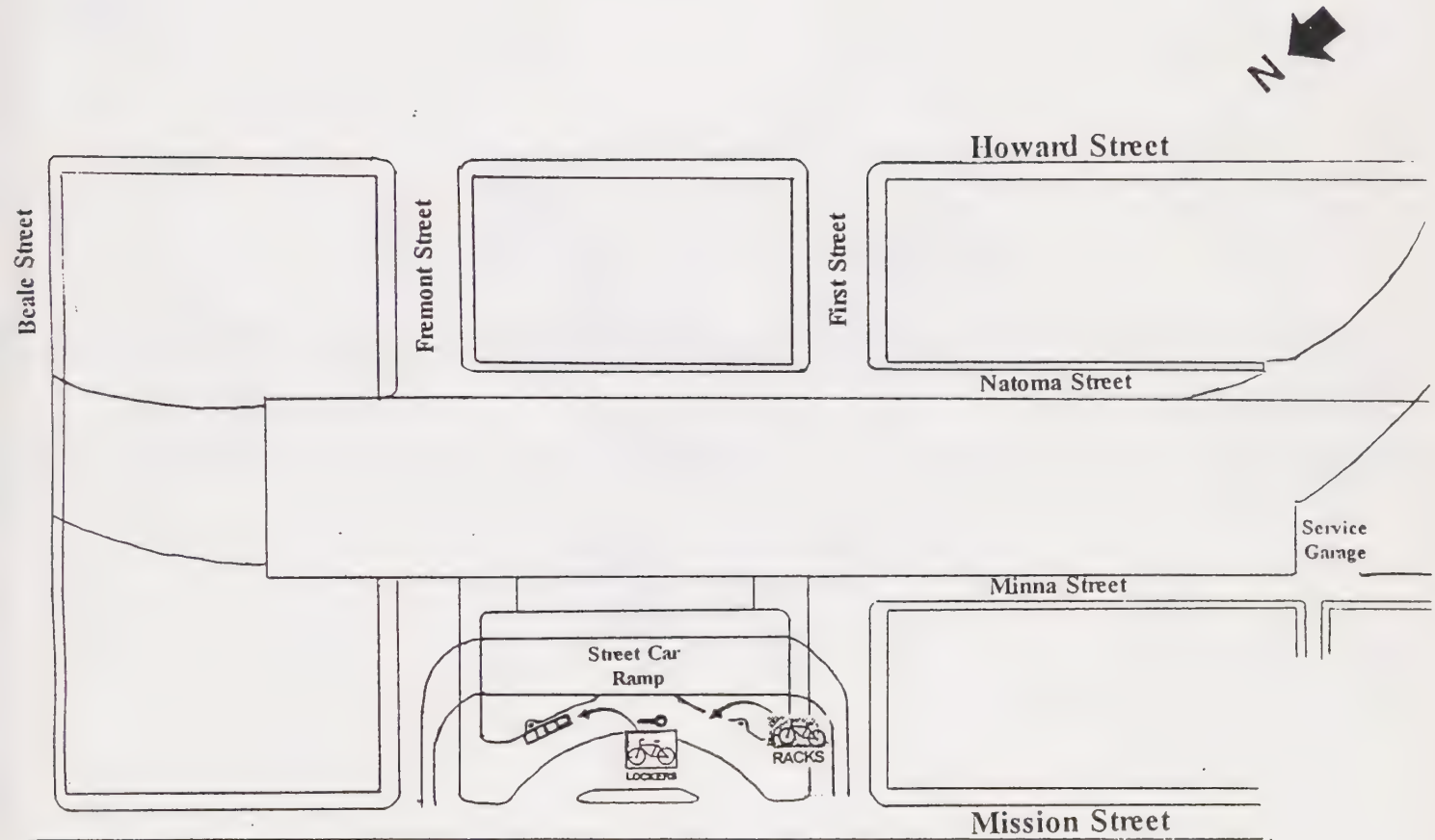
3. 16th Street/Mission BART Station - This BART station is located below grade at 16th Street and Mission Street. The station is located on the Daly City/San Francisco line and has direct access to BART's other three corridors, Richmond, Concord and Fremont. There are two entrances into the station, one on the northeast corner and one on the southwest corner of the intersection. (See Figure 7-5.) Average daily weekday ridership for the station is approximately 5,800 passengers.

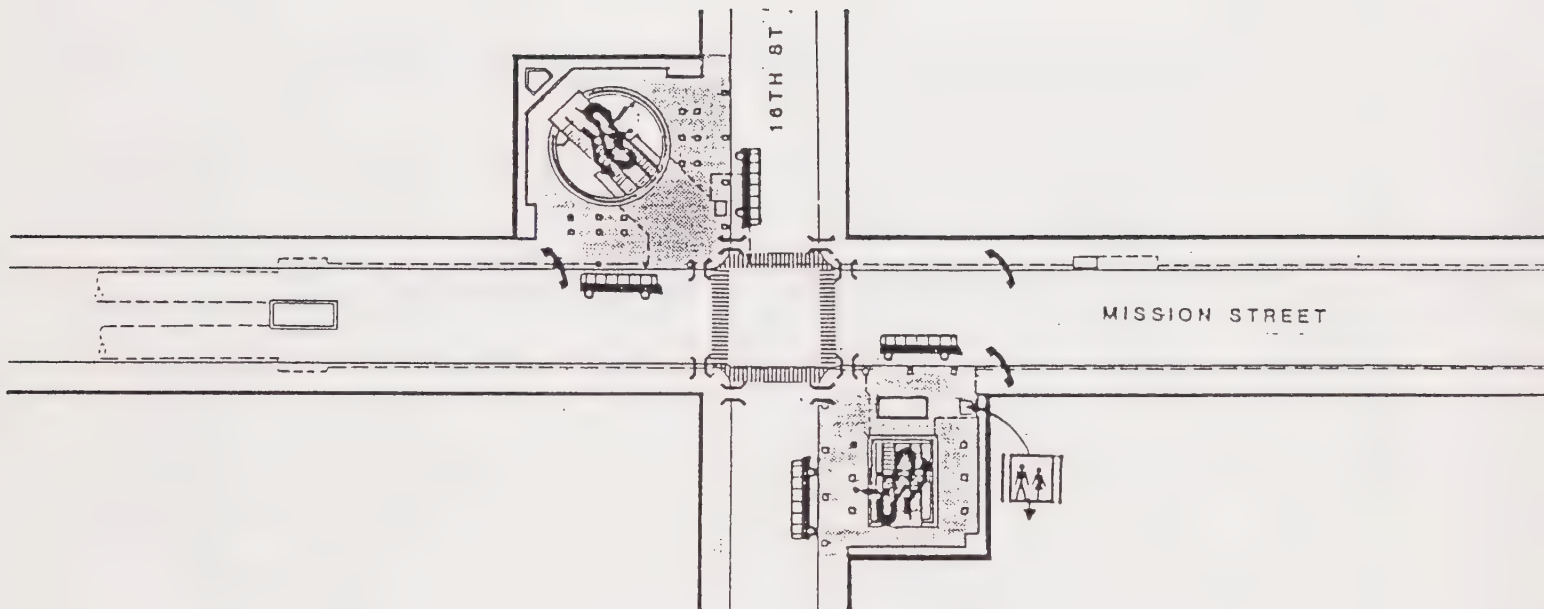
There is currently no bicycle parking available at this station. Discussions with BART staff indicated that the decision not to place bicycle parking above grade was based on the fact that the lockers or racks would not be in sight of a station agent. According to the BART representative, no bicycle lockers have been placed below grade due to potential safety conflicts on escalators and elevators. This representative stated that bicycle lockers could potentially impede the flow of commuter movement through the below grade station areas. Currently there are no plans for BART to add any lockers to below grade stations where they could be easily viewed by existing station agents. A more appropriate approach might include the relocation of existing and future bike racks into the BART station so that the racks were visible by the station agent, thereby increasing the security of the parked bikes. In addition, this approach would allow the casual or potential bike to transit commuter the opportunity to try this form of commute without paying for a month's locker rental fees. Moreover, it might be possible for BART to combine this function with a concession contract, assuming space was available, and totally avoid the use of their own station agents as the source of guarded parking.

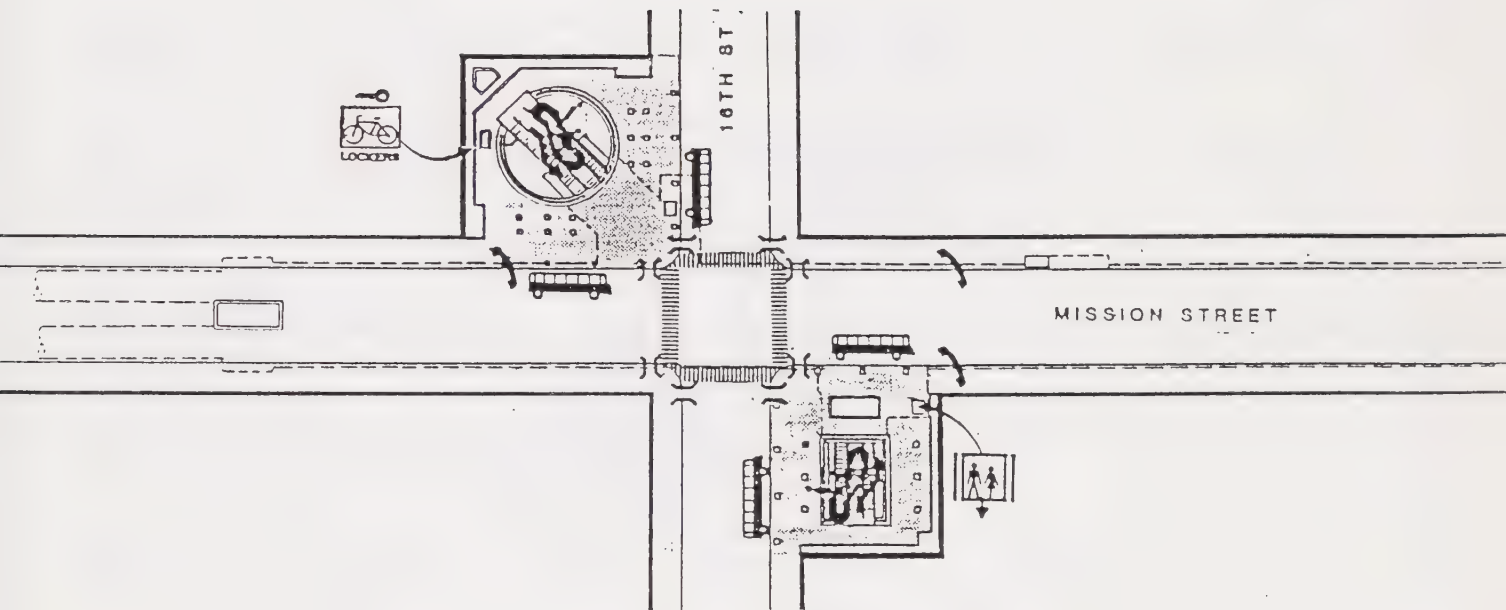
Although all of the above recommendations are applicable to all the City's BART stations, the need for bicycle parking at this particular station is relatively low, given the lower number of passengers that use this facility, compared to the others in this analysis. One or two bicycle lockers at one of these corners would meet any parking demands that may exist. It would be important to strategically locate the lockers to minimize vandalism and maximize their viability. Other safety conditions including lighting and traffic movement around potential at grade lockers was considered fair in the site observation.

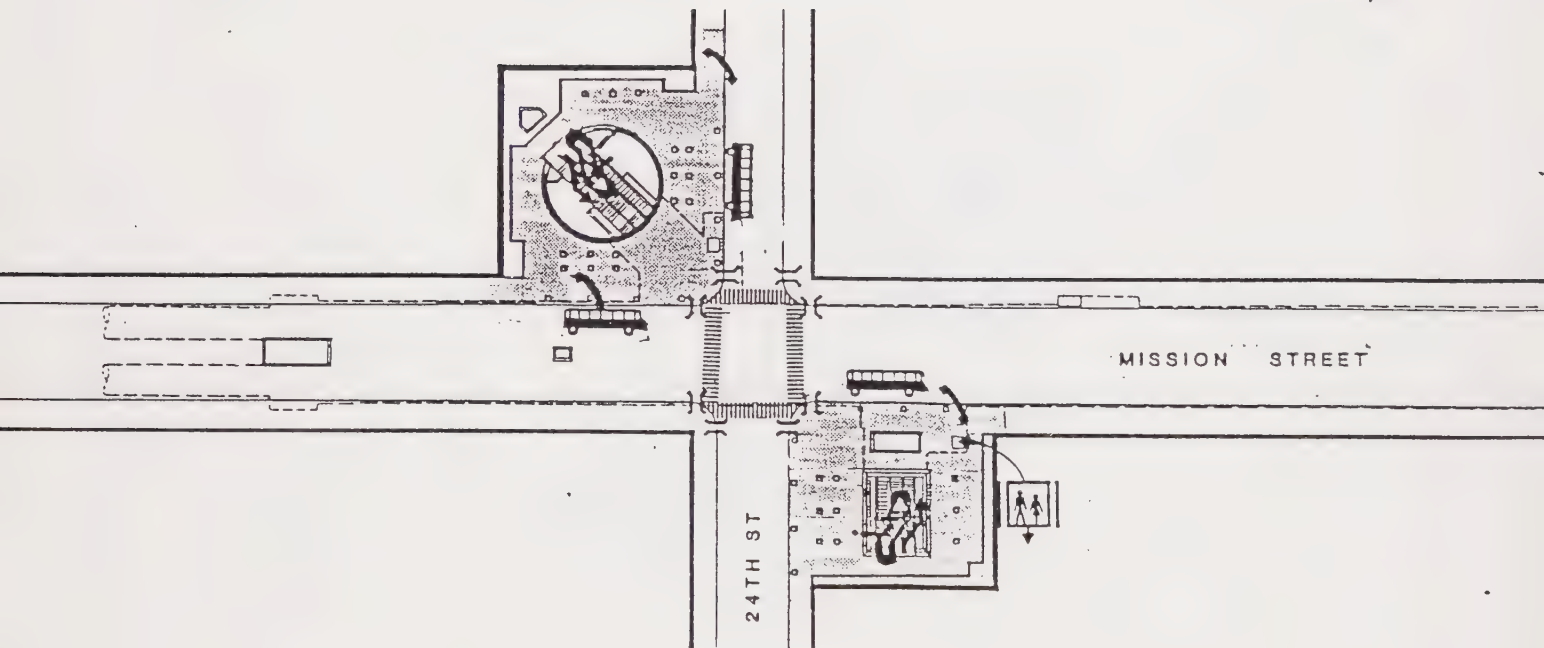
The current recommendation for this transit location is the addition of four free-standing lockers. The location of this locker is recommended adjacent to the escalators, in the southeast corner of the intersection. (See Figure 7-6.) This recommendation however, was influenced by the very strong opposition to below grade bicycle lockers, as stated by the interviewed BART spokesperson. The long term objectives of the San Francisco Comprehensive Bicycle Plan should be the location of substantially expanded and secure bicycle parking spaces at the below grade station locations.

4. 24th Street Mission/BART Station - The 24th Street/Mission BART station has all the same characteristics of the 16th Street station. Located below grade, there are no existing bike parking facilities. (See Figure 7-7.) Similarly to the 16th Street station, the conditions surrounding this station were considered fair. Average daily ridership for the 24th Street station is approximately 8,600 passengers per day. No opportunities are currently available for guarded and secure bicycle parking.









As in the case of the 16th Street station, four free-standing locks are also recommended for this site, also to be installed adjacent to the escalators, in the southeast corner of the intersection. (See Figure 7-8.)

5. Glen Park BART Station - The Glen Park station is the third stop from the end of the Daly City BART line. This above-ground station is on the corner of Bosworth Avenue and Diamond Street, adjacent to Interstate 280. The station serves approximately 5,700 daily passengers.

Currently three bicycle lockers are located on the Diamond Street side of the station. In addition, bicycle racks are located on the Bosworth Avenue side of the station. (See Figure 7-9.)

At the time of this interview, the Glen Park Station had one person on the waiting list for the existing six lockers. The conditions surrounding the station are rated as good with regard to safety, lighting, access and traffic movements.

Given the number of passengers using this site and the favorable conditions surrounding the station, the addition of four lockers is recommended. This analysis suggests that the lockers be located on Bosworth Avenue, next to the bus pullout. (See Figure 7-10.)

6. Balboa Park BART Station - The Balboa Park BART station is an underground station located in the southern portion of San Francisco. The station is one away from the end of the Daly City BART line. The station is located adjacent to Interstate 80, near the intersection of San Jose and Geneva Avenues. There are entrances into the station on either side of Geneva Avenue, between San Jose Avenue and the Interstate 280 on-ramp. Average daily ridership through this station is highest of the City's non-subway stations, approximately 10,000.

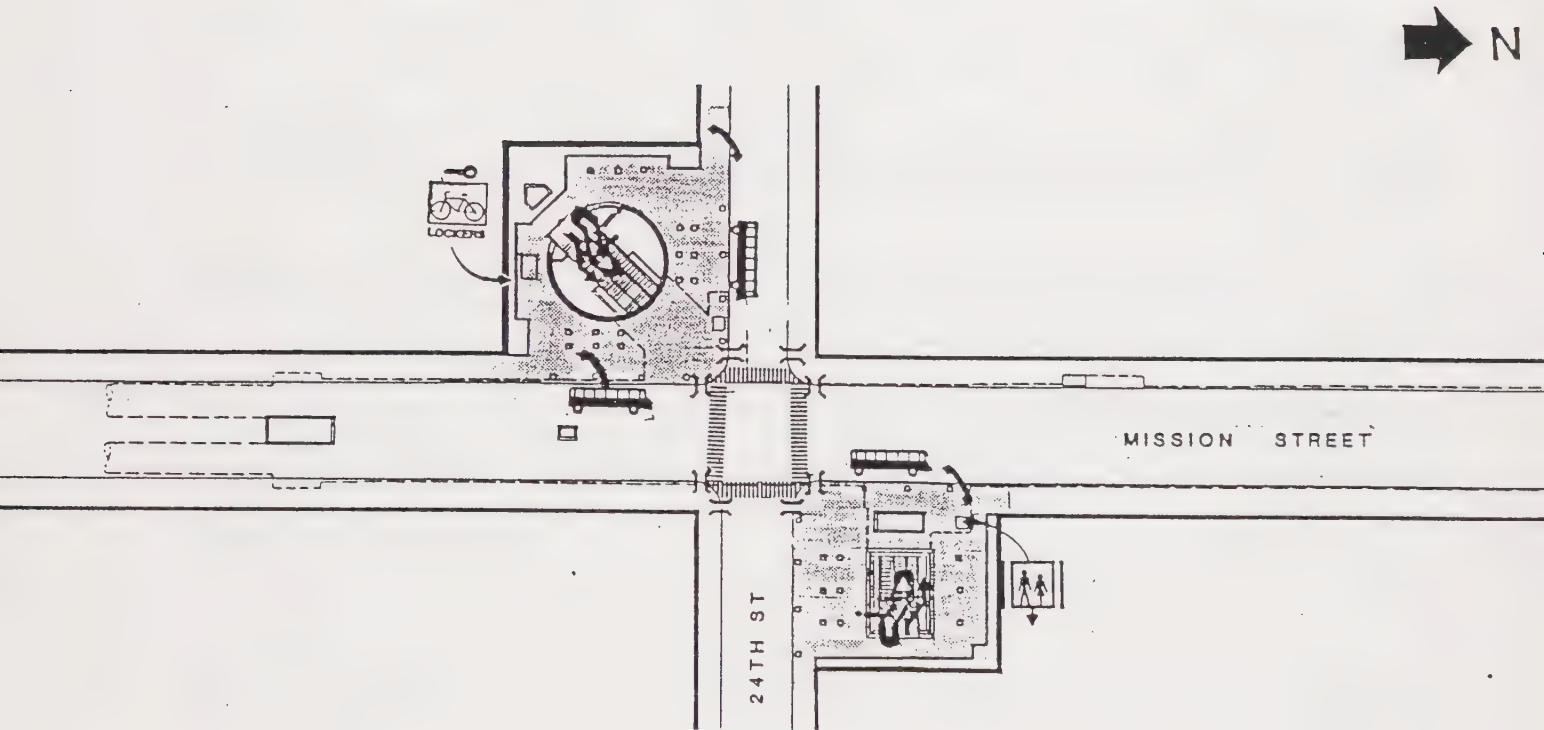
Eight bike lockers are currently located just outside the BART entrance on the north side of Geneva Street. Rack parking spaces are located outside both entrances on both sides of Geneva Street. (See Figure 7-11.) Based on our site visit, it appears that the parking is used primarily by local bicyclists who take BART to downtown San Francisco for work. The conditions surrounding the station are well suited to bicycle access. Accessibility, lighting, safety and traffic movement were all rated as good. At the time of this interview, a total of four individuals were on the waiting list for the existing four lockers.

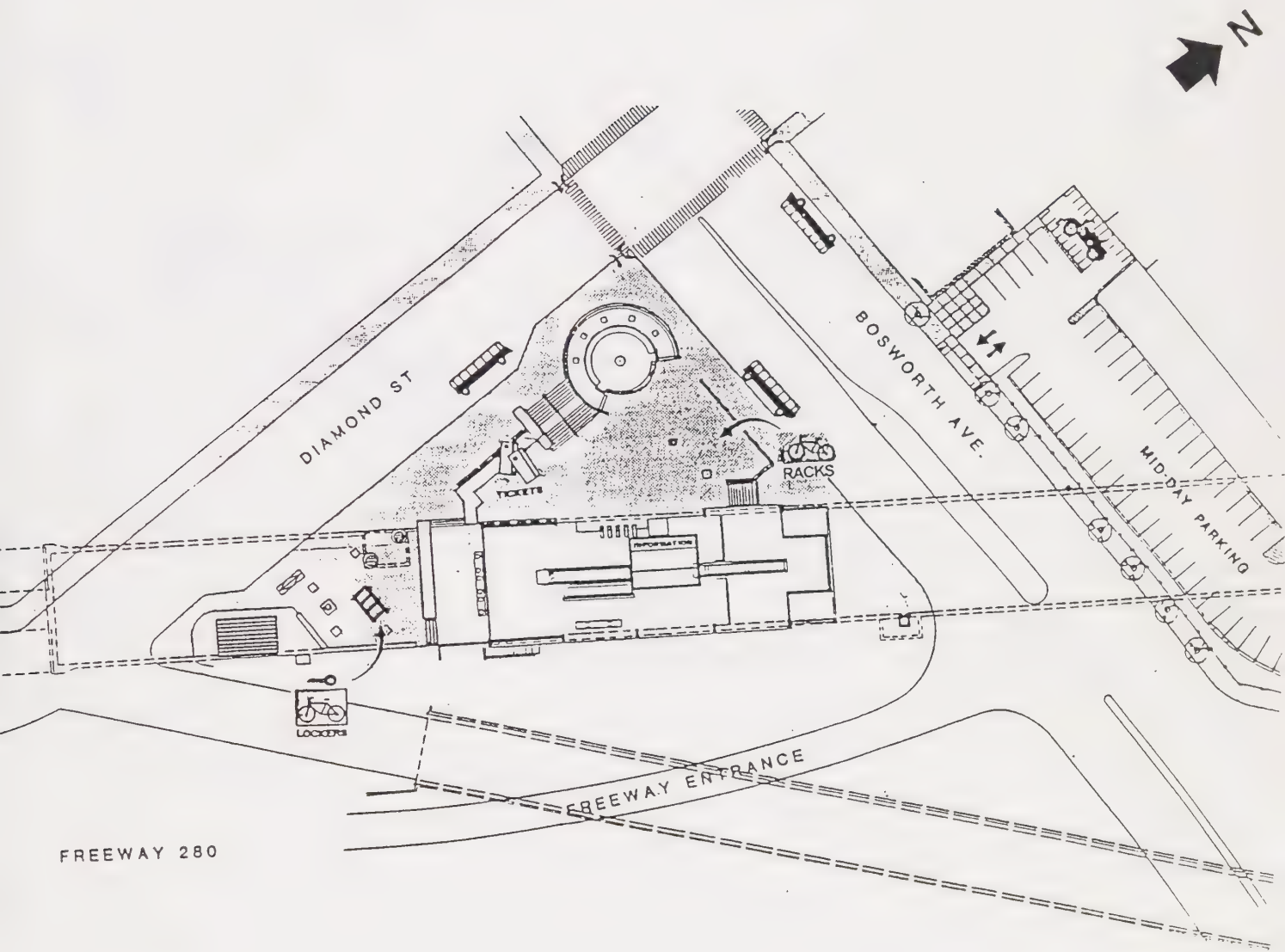
The existing bike facilities appear to be fairly well used. Based on this observation, it is recommended that eight new lockers be provided at the site, south of Geneva Street, adjacent to the existing bike racks. (See Figure 7-12.)

Additional Recommendations

In addition to the individual recommendations contained for each of the six San Francisco facilities, the following recommendations should also be pursued:

1. Large guarded facilities are appropriate for those stations with rail commuter patronage. This would include the Embarcadero, Civic Center, and Powell Street BART stations.





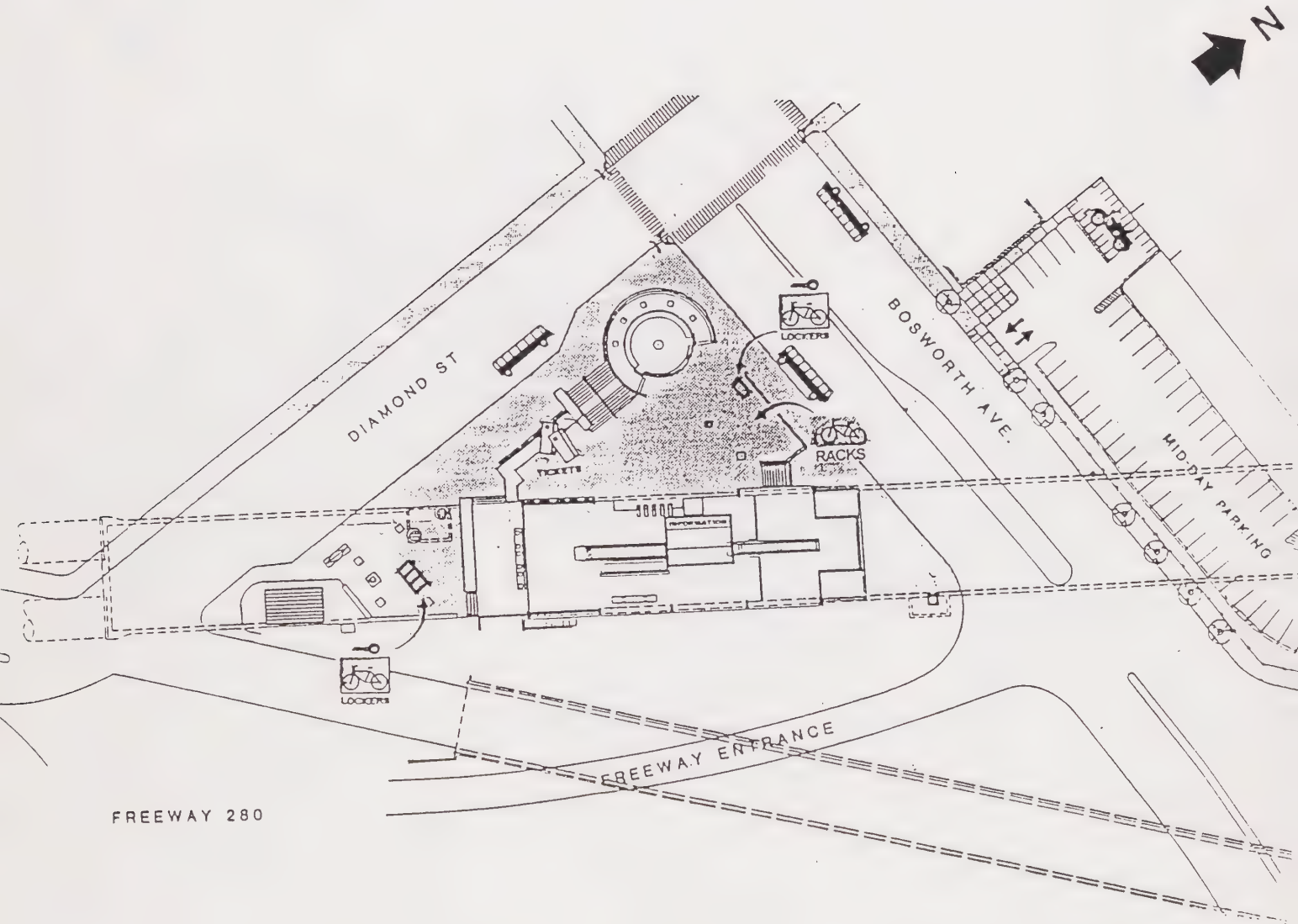
FREEWAY 280



WILBUR SMITH ASSOCIATES

GLEN PARK BART STATION - EXISTING BICYCLE PARKING

Figure 7-9
PASTEUP - 2/2/95P



FREEWAY 280



WILBUR SMITH ASSOCIATES

GLEN PARK BART STATION - PROPOSED BICYCLE PARKING

Figure 7-10

PASTEUP - 2/2/95P

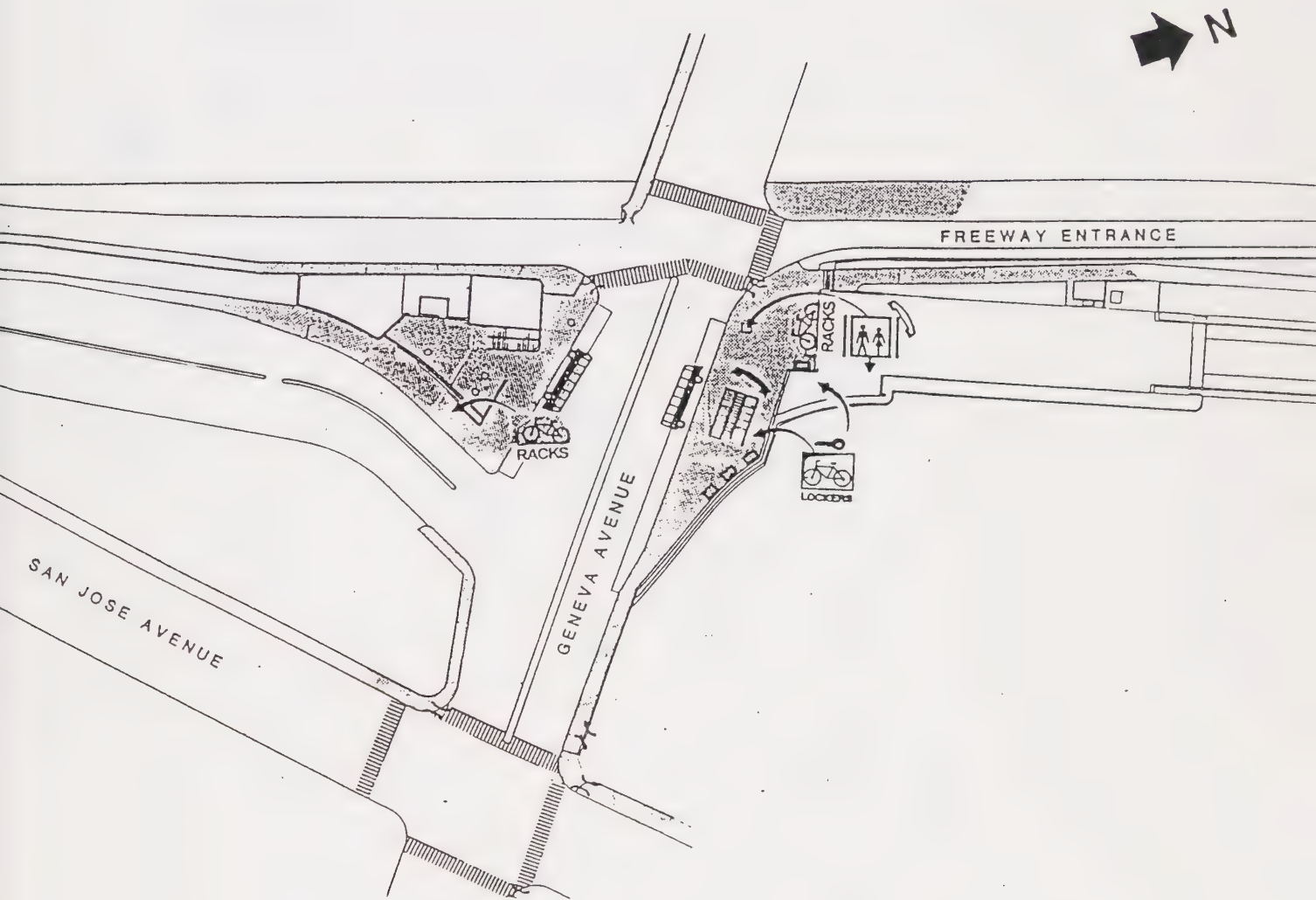
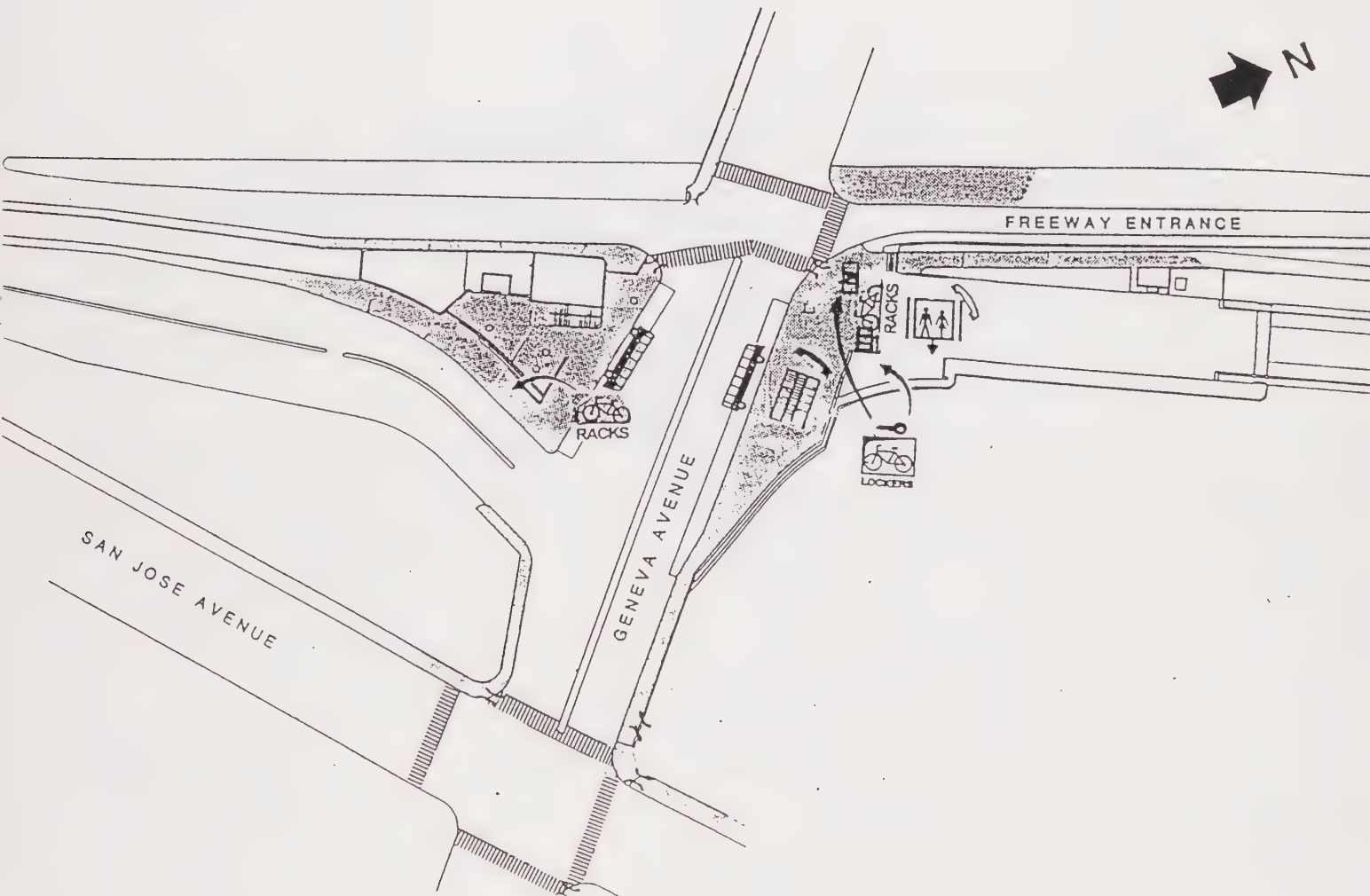


Figure 7-11

BALBOA PARK BART STATION - EXISTING BICYCLE PARKING





2. Over the next two years, major planning and design activities will be directed towards San Francisco's Ferry Building, the CalTrain Station at Fourth/Townsend, and the Transbay Terminal. All of these plans should have significant bike parking elements including but not limited to guarded parking, bike rental facilities, and bike support/maintenance facilities.
3. In addition to reserved parking facilities, San Francisco should include the need for secure all-day parking on a less than daily basis. This recommendation is particularly appropriate for those stations with high volume tourist and commuter trips where attendant parking employees could also be used for other railway related tasks.
4. As a result of the recommendations for the San Francisco Bicycle Plan, discussions between the City of San Francisco, BART, the San Francisco Congestion Management Agency, and MTC should be initiated to address BART's current opposition to secure, guarded bike parking facilities, located below grade at major San Francisco locations.



8. BICYCLE POLICIES, ORDINANCES AND LEGISLATION

INTRODUCTION

The objectives of this chapter are to:

- Identify existing City policies, practices, standards, and regulations that directly or indirectly affect bicycling.
- Recommend changes and additions to City policies and ordinances that would integrate bicycling into the transportation system, encourage bicycle usage, and improve safety.
- Ensure that City policies, regulations, and ordinances are consistent with state law and are in the best interests of bicyclists.
- Identify training needs and opportunities for City planners and engineers.

The chapter includes the following subjects:

- Recommended changes to the Transportation Element of the San Francisco Master Plan, including, but not limited to, the element's bicycle section.
- A review of existing City traffic ordinances affecting bicycling.
- A discussion of several related legal questions.
- Proposals for other ordinances that the City should adopt.
- An evaluation of the existing system of bicycle registration in California and recommendations for a San Francisco bicycle registration program.

The topic of City policies includes a broad range of subjects, including policies on planning, design, maintenance, land use, funding, education, public relations, enforcement, and coordination with state, federal and other local agencies. Among these policies, the ones of most immediate and lasting importance to bicyclists are those dealing with the planning, design, and maintenance of roadways. Planning policies are addressed primarily via comments on the Transportation Element of the Master Plan. The recommendations of this plan regarding the transportation element are contained in Appendix G. Design issues and many other policy questions are addressed more directly in other chapters.

In addition, this chapter deals with a variety of subsidiary policies that reflect the City's view of bicycling as a mode of transportation. Careful attention to these policies can help to improve the climate for bicycling. Conversely and more important, a genuine concern for bicyclists' needs will

eventually be manifested in City policies and decisions of all kinds. The policies, while often minor in themselves, therefore function as a barometer of the City's attitude toward bicycling.

The guiding principle of these policies is to consider bicycling as a legitimate mode of transportation, with rights (and responsibilities) equal to those of other, more familiar modes, including the automobile. This should be done as a matter of course, not as an afterthought. If a policy affects transportation directly—say parking facilities—bicycling should, at a minimum, receive equal treatment. If a policy affects transportation indirectly—say land use—bicycling should also receive equal treatment. This does not mean that bicyclists and motorists must be treated identically. Bicyclists and motorists need different kinds of parking facilities, for instance; equal treatment for bicyclists means that they receive what they need on the same basis as motorists, not that they receive exactly the same facilities as motorists. The phrase "at a minimum" means that in some circumstances the City may want to recognize the social benefits of bicycling by according it preferential rather than equal treatment.

The rest of this chapter illustrates representative applications of this principle, which can be used as a guide to evaluate policies not covered here.

CITY ORDINANCES AND TRAFFIC LAW

This section analyzes City policies, regulations and ordinances for consistency with state law and the interests of bicyclists.

Traffic law is regulated by the State of California, and cities and counties may not regulate traffic on their streets, including bicycle traffic, except where they are expressly authorized to do so. As part of this state regulation, bicycles are generally required to obey the same rules of the road as vehicles. The legal background for these important statements is given in Appendix G.

San Francisco Traffic Code Background

Because the California Vehicle Code, from which the City derives its regulatory authority and with which it must not conflict, was recodified in 1959 and has often been amended since, portions of San Francisco's Traffic Code (part of the Municipal Code) may be invalid, as well as confusing and out of date. To provide clear, useful, uniform regulation, with simple administrative procedures to implement modern policies, portions of the code should be reconsidered.

Several sources offer guidance for this examination, such as the Model Traffic Ordinance (MTO) of the National Committee on Uniform Traffic Laws and Ordinances (NCUTLO) and the model ordinance published by the National Institute of Municipal Law Officers (NIMLO), an association of city and county attorneys. California Senate Concurrent Resolution 47 of 1973 created a Statewide Bicycle Committee—often referred to as the SCR 47 Committee—to review California bicycle law and recommend revisions, many of which were subsequently adopted. This committee's report includes a Model Bicycle Ordinance (MBO)—also called a Uniform Bicycle Ordinance (UBO)—for the guidance of local jurisdictions. This ordinance is patterned after and is intended to supplement the League of California Cities' Uniform Traffic Ordinance.

The principal subject of most local bicycle ordinances is registration. San Francisco currently has no registration ordinance, and this topic is discussed at length in a later section of this chapter.

Sections of the Traffic Code That Should Be Repealed

The Traffic Code contains several sections regulating bicycles that should be repealed because they are preempted by the Vehicle Code and are therefore invalid. Retaining invalid and unenforceable code sections creates confusion over the law among bicyclists, police officers, and courts.

- Sec. 3.14 (adopted 1962) defines the term "bicycle," and is preempted by Vehicle Code §231. There are some minor differences in the definitions: San Francisco requires a bicycle to have exactly two wheels and to be propelled through pedals, while the Vehicle Code specifies one or more wheels and a belt, chain, or gears. The Vehicle Code definition excludes children's tricycles, because they are propelled by direct drive; the San Francisco definition, on the other hand, excludes adult tricycles and pedicabs.
- Sec. 4 (adopted 1940) provides that bicyclists are subject to the provisions of the Traffic Code applicable to the driver of a vehicle. Since those Traffic Code provisions are authorized by the Vehicle Code, this section is preempted by Vehicle Code §21200, which adds that bicyclists also have "all the rights" of the driver of a vehicle.
- Sec. 97 (adopted 1955) prohibits carrying passengers on the handlebar, top tube, or package carrier of one-seat bicycles, on either the street or the sidewalk. It is preempted on the street by Vehicle Code §21204, enacted in 1963, which simply requires passengers to ride on a separate attached seat.
- Sec. 99 (adopted 1940) prohibits clinging to vehicles or streetcars, and is preempted by the substantially similar Vehicle Code §21203, enacted in 1963.

Sections of the Traffic Code That Should Be Revised

Bicycling on Sidewalks - The Vehicle Code makes sidewalk bicycling subject to local regulation. Traffic Code Sec. 96 makes it unlawful to ride a bicycle on a sidewalk, except at a permanent or temporary driveway or on bikeways established by resolution of the Board of Supervisors. The Traffic Code specifies an exception to this rule: children under 13 riding "sidewalk bicycles" may ride on sidewalks, exercising due care and giving pedestrians the right-of-way, except in front of schools, stores, or buildings used for business purposes—in other words, only in residential areas. Traffic Code Sec. 3.15 defines a sidewalk bicycle as a bicycle having a wheel diameter of less than 21 inches, including the tire. This rule and exception are an allowed use of local authority under the Vehicle Code.

Sidewalk bicycling is common in residential areas by young children too inexperienced to ride in the street. Nevertheless, the case against bicycle riding on sidewalks, at least sidewalks with numerous pedestrians or along busy streets, is a reasonable one. Bicycles on sidewalks or paths can come into conflict with each other, with pedestrians of all varieties—walkers, dog-walkers, stroller-pushers, joggers, runners, roller-skaters, skateboarders—and with people in wheelchairs. Moreover, a bicyclist

on a sidewalk may periodically enter the traveled way at intersections and driveways, often from unconventional locations and directions, at relatively high speed, and with inadequate sight lines and ambiguous duties to yield, creating potentially severe conflicts with motor vehicles.

A recent study by Wachtel and Lewiston⁽¹⁾ finds the risk of a bicycle-motor vehicle collision to be, on average, 1.8 times as high on the sidewalk as on the adjacent roadway, at a 99 percent confidence level. Because of these safety issues, the California Highway Design Manual finds that the designated use of sidewalks as Class III bike routes is "unsatisfactory."

Since traffic speeds and volumes tend to be lower on residential streets, and residential driveways are much less busy than business driveways, potential conflicts are reduced, but they are not eliminated. Nevertheless, sidewalk bicycling in residential areas, particularly by children, is accepted, and it is probably impractical to prohibit it.⁽²⁾ The San Francisco ordinance allows sidewalk bicycle riding for children under 13 in residential areas. There is no reason, however, to distinguish "sidewalk bicycles" from other bicycles. Thus the definition of sidewalk bicycle in Sec. 3.15 should be eliminated, and Sec. 96 should be amended to remove the superfluous reference to sidewalk bicycles.

The argument can be made that it is equally unnecessary to distinguish children from adults, at least on residential sidewalks, and that the key issue is to control the behavior of bicyclists around pedestrians. Thus the reference to age should also be eliminated from Sec. 96.

There are other areas where it is recommended that sidewalk bicycle riding also be permitted, such as the existing sidepaths along Sunset Boulevard and O'Shaughnessy where bicycles are currently allowed, on the Embarcadero, and other places. Although some bicyclists would like to see sidewalk bicycling for adults legalized everywhere in the City, restrictions on sidewalk riding in business districts, at least during hours of significant pedestrian activity, seem reasonable to ensure pedestrian safety. The City should add the following language to the Traffic Code in order to address pedestrian safety issues at all sidewalks:

A person operating a bicycle upon and along a sidewalk, crosswalk, bicycle path, or pedestrian facility shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing any pedestrian.⁽³⁾

Even where bicycling on sidewalks is permitted, it is inappropriate, as the design standards state, to sign the sidewalks as bicycle facilities, and it remains important to provide clear sight lines at intersections. For example, the sidepath adjacent to O'Shaughnessy is currently signed as a bike route. While it may not be appropriate to allow bicycles to use this path, neither is it appropriate to sign it as a bike route, for several reasons:

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- (1) Alan Wachtel and Diana Lewiston, "Risk Factors for Bicycle-Motor Vehicle Collisions at Intersections." ITE Journal, September 1994, pp. 30-35.
 - (2) In fact many police officers at bicycle rodeos specifically instruct children under 12 to ride on the sidewalk rather than on the street.
 - (3) Note that the audible signal might be a voice warning; it need not be a bell or other equipment (which the City could not require).

- Bicyclists who travel at high speeds are safer on the roadway, and indeed should ride on the roadway for pedestrian safety as well.
- The path is on only one side of O'Shaughnessy, which encourages the dangerous practice of wrong-way riding.
- Finally, signing the sidepath as a bike route incorrectly suggests to motorists that bikes are not allowed on the roadways.

While permitting bicycles on the O'Shaughnessy or Sunset paths may seem contrary to the earlier discussion about bicycles on sidewalks, the distinction is that even though bicycling is permitted, such facilities should not be signed as bike routes. The use should be consistent with the safety of pedestrians, handicapped persons, and other sidewalk users while allowing the bicyclist to choose a safe place to ride consistent with his/her abilities.

Broadway Tunnel - Traffic Code Sec. 96.1 prohibits bicycling on walkways in Broadway Tunnel. This is a proper use of local authority (a roadway prohibition would not be). A sign posted on the walkway at the entrance to the Broadway Tunnel eastbound says "Bicycle Riding Prohibited, Sec. 96.1 T.C."

The language of the ordinance and the apparent intent of the sign are to prohibit bicycling on the *walkways* in the Broadway Tunnel. Nonetheless, bicyclists report being routinely cited for bicycling on the *roadway*. Since the latter behavior is legal, such enforcement is incorrect, inequitable and discriminatory. Police officers should be instructed on where the prohibition applies, and if the restriction is retained, the regulatory signs should be made more clear.⁽⁴⁾ As for the existing walkway prohibition, this plan recommends an alternative to it, which was presented in Chapter 3.

Bicycle Messengers - Bicycle messengers provide a substantial service on which many businesses rely, but because they work on piece rate and are poorly paid, the incentive to hurry is strong. Messengers are therefore more likely than most bicyclists to run red lights, ride against traffic, or interfere with pedestrians. These violations are highly visible and give rise to strong emotions on all sides.

Traffic Code Secs. 98 to 98.3 require bicycle messengers to carry personal identification and their bicycles to be identified by business name and an individual number. Businesses must maintain a mug book of all bicycle-riding employees, and a log of messengers and their bicycles. These sections, adopted in 1981 at the request of the administration then in office, presumably encourage bicycle messengers to obey traffic laws and aid in the identification of messengers who violate the law. The requirements deal not with the regulation of traffic or the operation, use, or equipment of bicycles, but rather with identification for business purposes. Assuming that these provisions are a valid exercise of local regulatory power and are not preempted by the Vehicle Code, they would be more likely to withstand a legal challenge if placed in a portion of the Municipal Code regulating businesses, rather than in the Traffic Code.

⁽⁴⁾ Note that there is no comparable prohibition against bicycling in the Stockton Tunnel.

Furthermore, messenger regulations are now observed and enforced only sporadically, and it can be argued that they create a presumption of wrongdoing. The City should reevaluate their effectiveness and revise them as appropriate. New York City has similar requirements, but as part of their Administrative Code.⁽⁵⁾

A more direct method to control the behavior of bicycle messengers, if the City desires, would be to require the messengers or their employers to be licensed and insured (as do New York, Chicago, and Washington: In the case of New York, the law is not strictly enforced as it is considered essentially useless and unnecessary.)⁽⁶⁾ They could then be held liable in the event of an injury. Enforcement of the requirement, however, would require a layer of bureaucracy whose cost may be difficult to justify. Moreover, the cost to the messenger companies may put some out of business.

The New York City advocacy group Transportation Alternatives recommends instead that messenger companies be required to provide safety training for all employees; offer helmets, lights, reflectors, and other safety equipment to riders; and publicize workers' compensation regulations. San Francisco should adopt these measures before considering more coercive alternatives.

Parking of Bicycles - Sec 219.2 prohibits stopping or parking bicycles on the sidewalk so as to obstruct it or inhibit the forward progress of pedestrians, but permits it otherwise. This is a permitted form of local regulation, and consistent with the California Vehicle Code and the Uniform Vehicle Code, but it largely duplicates Vehicle Code §21210, which states that "No person shall leave a bicycle lying on its side on any sidewalk, or shall park a bicycle on a sidewalk in any other position, so that there is not an adequate path for pedestrian traffic."

The Model Traffic Ordinance (§33-404) and many cities provide more specific guidance to permissible bicycle parking practices. San Francisco should also consider the following language proposed by the recent Federal Highway Administration publication, "Case Study 13: A Synthesis of Existing Bicyclist and Pedestrian Related Laws and Enforcement Programs":⁽⁷⁾

- (a) No person shall park any bicycle against windows or on the main traveled portion of the sidewalk, nor in such manner as to constitute a hazard to pedestrians, traffic, or property. If there are no bicycle racks, bicycles may be attached in an upright parallel position to any public pole such as a light post or parking meter, as long as said pole is within twenty-four (24) inches of the curb.
- (b) A bicycle may be parked on the roadway at any angle to the curb or edge of the roadway at any location where parking is allowed.
- (c) A bicycle may be parked on the roadway abreast of another bicycle or bicycles near the side of the roadway at any location where parking is allowed.

⁽⁵⁾ N.Y.C. Administrative Code section 10-157.

⁽⁶⁾ Paul Harrison. Transportation Alternatives. New York City, New York. Personal communication.

⁽⁷⁾ Federal Highway Administration, Case Study No. 13, *A Synthesis of Existing Bicyclist and Pedestrian Related Laws and Enforcement Programs*. 1993, pp. 27-28.

- (d) No person shall park a bicycle on a roadway in such a manner as to obstruct the movement of a legally parked motor vehicle.
- (e) In all other respects, bicycles parked anywhere on a highway shall comply with the provisions regarding the parking of vehicles.

Further restrictions on bicycle parking should not be adopted unless there is a convenient and secure alternative, as discussed in Chapter 7.

OTHER LEGAL QUESTIONS

This section considers several questions involving the application of vehicle law to bicycles, often in situations where it seems that bicycles and motor vehicles could or should be treated differently, such as passage through barriers or passing on the right. For the most part, California law fails to provide a clear mechanism for making such distinctions, and there are no good models in other states. Cities and counties, in turn, have often ignored these issues and their own lack of authority, and have gone ahead and done as they see fit. This discussion attempts to decide what practices would be safe, and how clear legal authority for them can be provided.

Excepting Bicycles from Regulatory Signs

In carefully selected locations, it may be desirable to regulate intersection movements in favor of bicycles, or to except bicyclists from prohibitions that apply to motorists. For instance, a barrier or other traffic calming device might be signed "Do Not Enter" for motorists, but bicyclists could be expressly permitted to continue through it. San Francisco has numerous "No Left Turn" prohibitions at intersections; permitting left turns by bicyclists in selected locations, if it can be arranged for this to be done safely, would facilitate bicycle travel.

The following discussion describes the legal basis for San Francisco to employ "Except Bicycles" signs where vehicle traffic is being restricted.

Vehicle Code §21101(f) permits local authorities to prohibit entry to or exit from any street by means of islands, curbs, traffic barriers, or other roadway design features. §21461(a) requires drivers of vehicles to obey signs placed on the barriers; the signs must conform to the uniform standards and specifications of §21400. Local authorities are also permitted to regulate turning movements at intersections by placing signs or other traffic control devices, and it is unlawful for vehicular traffic to disobey these signs (§22101).

Under §21200, traffic laws that apply to drivers of vehicles apply also to operators of bicycles, including these prohibitions and turn restrictions. There is no provision for local authorities to differentiate between vehicles and bicycles. On the whole this is strongly to cyclists' advantage, since most such discrimination would undoubtedly be against bicyclists. As a result, there is also no authority to discriminate in favor of bicyclists.

§22101 of the Vehicle Code permits local authorities to require or prohibit turning movements at intersections by means of signs or signals. *"Any driver of a vehicle"* must obey the signs or signals. Any such prohibition that applies to vehicles would also apply to bicycles. In addition, §22101(a)

permits local authorities to erect signs regulating or prohibiting turning movements at intersections; subdivision (c) requires that notice of a prohibited right or left turn must be given by a sign; and subdivision (d) makes it unlawful for "*any driver of a vehicle*" to disobey such a sign. Again, a prohibition applying to all vehicles would apply to bicycles. Finally, §22113 permits local authorities by ordinance to prohibit the making of any turning movement by any vehicle at or between intersections. It is not clear whether "any" means "any specified" or "all," and there is no case law construing this section. However, any prohibition that applied to all vehicles would also apply to bicycles.

San Francisco exempts buses from left turn prohibitions at certain intersections. Its authority for doing so may be §22101(a), although that section does not confer any explicit power to prohibit turns by specified types of vehicles (that is, all those that are not buses); on the contrary, subdivision (d) implies that the prohibition is meant to apply to all vehicles. In any case, because §21200 makes bicyclists subject to all provisions applicable to the driver of a vehicle, cities have no authority to prohibit turns by vehicles while permitting them by bicyclists.

STOP signs that exempt cable cars, on the other hand, are clearly lawful, because cable cars, which run on tracks, are not legally considered vehicles, nor do they have the rights of or are they subject to the provisions applicable to the driver of a vehicle.

The City of Palo Alto has installed "Except Bicycles" plates on "Do Not Enter" signs at many traffic barriers. Palo Alto also signs a busy intersection near Palo Alto High School (Churchill at Alma) to require motorists to turn left during the morning rush hour, but permits bicyclists to continue by means of an "Except Bicycles" plate. These distinctions, although accepted and noncontroversial, are probably improper under state law since there is no specific provision in the vehicle code that would allow it.

San Francisco should therefore ask the Legislature to amend Vehicle Code §22101 to provide that Caltrans or local authorities may regulate or prohibit turning movements by vehicles *or specified types of vehicles, and that those agencies may except bicyclists from such a regulation or prohibition*. Similarly, the City should request that §21101(f) be amended to provide that local authorities may prohibit entry to any street by means of islands, curbs, barriers, or other design features, *and may except bicyclists from a prohibition*. These amendments would legitimize an already common and harmless practice.

Some cities or counties (such as Los Angeles County and the City of San Jose) reserve lanes exclusively for buses, not permitting even high-occupancy vehicles to travel in them (except for turns). The authority for such lanes appears to be §21655.7, which lets local authorities use a portion of a highway exclusively as a public mass transit guideway. "Guideway" is not otherwise defined. The Traffic Code of San Francisco (Section 31) also establishes transit-only lanes, and thus, bicycles are technically excluded from them.

Other cities such as Toronto, Canada, and Madison, Wisconsin, allow bicycles and buses to share these diamond lanes. These cities feel that both bicycles and buses are modes of travel that should be encouraged and have found that buses and bicycles can co-exist. Studies by the Federal Highway Administration and others indicate that curb lane widths between 14 and 16 feet are best to accommodate the shared use of the lane, although Toronto has used lanes as narrow as 10 feet. The City of San Francisco should allow bicycles to use its diamond bus lanes as well. The lanes should

be restriped as necessary to provide at least 14 feet of curb lane width. To be thorough, the City should also request the Legislature to amend §21655.7 so that local authorities may permit bicycles to travel on a mass transit guideway.

Passing on the Right

Is it legal for a bicyclist to overtake a motorist on the right? In general, Vehicle Code §21750 requires passing to be performed on the left at a safe distance, and this applies to passing by bicycles as well as automobiles. There are, however, several exceptions to this rule.

The principal exception, in §21754, provides that the driver of a motor vehicle may pass a left-turning vehicle on the right. Passing on the right is also permitted when there is room for at least two lines of moving traffic in the direction of travel. Within a business or residential district the roadway need not be divided into lanes, but outside such districts it must be.

Passing on the right is also permitted on a one-way street or on a highway divided into two roadways. In these cases there is no restriction on width or lane markings. In both cases the driver need not change lanes to pass. Where lanes are marked, under §21658(a) a vehicle must be driven entirely within a lane, and passing on the right in general is permitted only when it can be done in safety (§21755).

Thus it seems entirely within the spirit of the Vehicle Code for a bicyclist to overtake a motorist on the right within a lane wide enough to accommodate a line of moving bicycles. This would clearly be the case where there is a bicycle lane or shoulder; in other places, it depends on the width and condition of the lane and on traffic speed and volume. There is a difficulty, however, with the letter of the law: §21754 refers only to *motor* vehicles, not to vehicles in general, and is therefore not made applicable to bicycles by §21200. This seems to be an oversight on the Legislature's part, since if construed literally, §21754 would require bicyclists to pass even left-turning motorists on the left. The City should ask the Legislature to correct this oversight.

Some bicyclists would like to have explicit permission to pass on the right, which would also have to be provided by the Legislature. Expressly permitting bicyclists to pass on the right, however, could create a potentially serious hazard. A bicyclist traveling near the curb, in a bike lane, or on the shoulder must not attempt to overtake on the right a vehicle turning right, a bus loading or unloading passengers, or a double-parked vehicle. Such conflicts are a major cause of car-bike collisions. The motorist is partly to blame for failing to approach the right-hand curb or edge of the roadway (§22100), failing to merge into the bike lane (§21717) and/or failing to signal his turn. But the bicyclist is often partly to blame as well for keeping too far to the right or trying to squeeze past a right-turning vehicle. A road position farther from the curb makes the bicyclist more visible and discourages improper turns on the part of the motorist. Bicycle lanes, in particular, encourage this conflict.

The problem does not arise when motor vehicles pass each other on laned roadways, because the right-turning rules in §22100, and lane markings and signs, never permit right turns from a position to the left of through traffic.

Unrestricted passing on the right is therefore not recommended. If the City proposes that passing on the right be permitted, it should request the Legislature to authorize such overtaking "only under conditions which permit the movement to be made with safety and without interfering with the safe operation of the overtaken vehicle."

Parking in Bike Lanes

With parking at a premium in San Francisco, it is common for cars to park in bicycle lanes, where they create a serious hazard (just as they would if parked in any traffic lane). This sections examines the legal implications of parking in bike lanes.

Vehicle Code §21207 allows cities and counties to establish bicycle lanes on the road in compliance with §891 (formerly §2376) of the Streets and Highways Code, which requires adherence to design criteria established by Caltrans. Those criteria are contained in Chapter 1000 of the Caltrans Highway Design Manual.⁽⁸⁾

To comply with these standards, the city or county must prohibit parking in bike lanes that are too narrow to meet the standards for bike lanes with parking. Parked vehicles that block the bike lane can be cited for violation of this local prohibition, which is normally signed, or of Vehicle Code §21211(b), which prohibits parking in a bikeway so as to impede or block the normal and reasonable movement of any bicyclist. (Vehicle Code §21208(a)(3) allows bicyclists to leave the bike lane to avoid the obstacle, although of course that may not always be desirable.) §21211(b) would also apply to parking so as to block a wide bike lane.

Double parking in a bike lane constitutes two offenses, which can be cited and fined separately: parking where prohibited by sign or by §21211(b), and double parking in itself (parking more than 18 inches from the curb, §22501(a)).

Fines in San Francisco are set by the Board of Supervisors. The fine for parking where prohibited is \$25. The fine for double parking is \$50.

There seems to be no need for changes to state law or local ordinances in order to enforce parking violations in bicycle lanes. There does seem to be a need for more thorough and consistent enforcement of existing laws, and for more thorough signing or pavement marking. Since bicycle lane violations block a lane of traffic, there may also be justification for increasing the fine for violations (§21211(b)). In addition, double parking by nature is usually short-term. In areas where double parking is a chronic problem, it may be indicative of the need for more short-term parking. If more green curb spaces were available for 10-20 minutes, (and enforced!) it may reduce the need and temptation to double park. Thus, it is recommended that the City not wait for a merchant's request for short-term parking but actively identify and re-designate curbs as such in areas of persistent double parking in bike lanes or bike routes.

⁽⁸⁾ Figure 1003.2A in that section shows the minimum widths for bike lanes (Class II bikeways). In an urban configuration with a rolled curb, this width is 4 feet where parking is prohibited, including at least 3 feet between the traffic lane and the longitudinal joint at the concrete gutter. (With a normal 2-foot gutter the minimum width is therefore 5 feet, not 4.) Where parking stalls or a parking area has been striped, the bike lane must provide 5 feet outside the parking area. Where parking is permitted but not striped, the minimum width is 12 feet, and 13 feet is recommended where there is substantial parking or turnover of parked cars is high (for example, commercial areas).

PROPOSED NEW POLICIES AND ORDINANCES

Proposed New Ordinances

Establishment of Bike Lanes - Under Vehicle Code §21207, local authorities may establish bicycle lanes on the street by ordinance or resolution. This official establishment is necessary for laws concerning bicycling or driving in bicycle lanes to be enforced.

San Francisco currently establishes each bicycle lane by separate ordinance, a cumbersome and inefficient procedure. It should not be necessary for the Board of Supervisors to approve each lane individually. It would be preferable instead for a single ordinance or resolution to officially establish the bicycle lanes designated on a specified plan as of a certain date and as thereafter amended; the amendment process would not need to involve the Board. Alternatively, the Board could delegate its authority to establish lanes to a suitable official.

Bicycle Coordinators - The Federal Intermodal Surface Transportation Efficiency Act requires each state to establish and fund a bicycle and pedestrian coordinator in its department of transportation. California statute now also requires a bicycle coordinator in the Department of Transportation. San Francisco currently has a bicycle coordinator in the Department of Parking and Traffic, but in a city of this size, it would be appropriate to adopt a similar local requirement to ensure that the position is permanent.

Shower Ordinances - Showers at the workplace can encourage bicycle commuting, and in some circumstances employee bicycle parking may go unused if showers are not provided as well.

Showers are often well used by noontime cyclists and runners, as well as those who commute to work by bicycle, and it is becoming a common practice for new developments to install fitness centers, including showers, in order to attract tenants and employees. Thus developers may not view a shower ordinance as a burden.

The cities of Palo Alto and Los Angeles both have shower requirements. In all zoning districts where such uses are permitted, Palo Alto requires the provision of employee shower facilities for any new building or for any addition to or enlargement of an existing building, in compliance with the following table:

Use	Gross Floor Area of New Construction	Number of Showers Required
Medical, professional, general business offices, financial services, business and trade schools and general business services.	0-9,999 sq. ft.	No requirement
	10,000-19,999 sq. ft.	1
	20,000-49,999 sq. ft.	2
	50,000 sq. ft. and up	4

Use	Gross Floor Area of New Construction	Number of Showers Required
Retail, personal and eating and drinking services.	0-24,999 sq. ft	No requirement
	25,000-49,999 sq. ft.	1
	50,000-99,999 sq. ft.	2
	100,000 sq. ft. and up	4

It is recommended that the City of San Francisco adopt a similar ordinance.

Small businesses are exempt from the expense of shower installation, but again, it may be possible for employees of these businesses to share showers at a common location, funded by a developer contribution or installed by the city through an impact fee or assessment district.

Proposed New Policies

The following additional policies are recommended for adoption by San Francisco. Many of these policies are already in use by cities in California and the United States, including Palo Alto, Davis, Seattle, Portland, and Boulder.

- Straight-through bicycle lanes should be provided to the left of right-turn-only lanes where possible; alternatively, additional width for bicyclists should be provided in the right-most through lane. This is only one example of how bicyclists' needs should be considered as part of roadway design. Design standards are considered in more detail in Chapter 5.
- Maintenance policies should recognize the needs of bicyclists for smooth and level pavement. Detailed recommendations are provided in a later section of this chapter. All streets on the Recommended Bikeway Network should be accepted streets as discussed on page 8-17.
- City employees should be reimbursed when they travel by bicycle on official business, as they are for automobile trips. A copy of the City of Palo Alto's bicycle mileage reimbursement policy is contained in Appendix G.
- The City should maintain fleets of bicycles and helmets for use by employees along with its motor vehicle fleets (as done by the Metropolitan Transportation Commission and Caltrans District 1).
- MUNI bus and trolley drivers should be authorized to allow bicyclists experiencing mechanical difficulty on board. Other policies regarding bikes on MUNI were addressed in Chapter 7.

- Hospitals, emergency rooms, and clinics should report all instances of bicycle injury to the San Francisco Police Department and to the bicycle coordinator. This information can help determine patterns and causes of injuries and aid in accident and injury prevention.
- The City should establish a policy providing incentives for households that do not own automobiles, such as a tax credit, a coupon for bicycle equipment subsidized by the City, a bicycle equipment manufacturer, or a large corporation, or other similar incentive.
- The *Guidelines for Environmental Review: Transportation Impacts*, published by the San Francisco Department of City Planning for consultants who are conducting transportation analyses for both Environmental Impact Reports and Negative Declarations, should be amended. These guidelines should require that all traffic counts conducted as part of the study also include bicycle counts at the same locations where motor vehicles are counted. An inventory of existing bicycle parking should also be conducted within a two-block radius of the site. The project's impacts on any existing or proposed bikeways designated in the Master Plan should be identified. Mitigation measures should not include the narrowing of a curb lane on any street, nor restriping or widening to provide a double right-turn lane where the second lane is a shared through-right lane.
- Bicycle parking and building access policies were recommended in Chapter 7.

MAINTENANCE POLICIES

Review of Existing City Policies and Procedures

Two steps were taken in developing policies and procedures for the maintenance of bikeways for the proposed bicycle route system as well as all of the streets of the city which will be used by cyclists:

- 1) Key maintenance personnel in the City's Department of Public Works (DPW) and Department of Parks and Recreation (DPR) were interviewed to assess the existing policies and procedures; and
- 2) Existing models from other municipalities and states were surveyed in order to determine whether their maintenance policies and practices could be applied to San Francisco.

City's Street Cleaning System - DPW - At present, the City's Department of Public Works follows a carefully thought-out and responsive system that establishes the daily schedule for cleaning the streets of San Francisco. The tracking technique for determining the day-to-day cleaning schedule comes from a master overlay mapping chart that the operation department of Street Environmental Services has developed over the last ten years. Previously, the daily schedule was determined by the engineering staff. However, it became evident that if the street cleaning schedules were not related to the changing social dynamics of this large metropolitan city, an operational crisis would ensue. Street cleaning schedules must keep abreast with the frequent and continuous changes

in land use and patterns of daily activities, or conflicts are created. In order to minimize these conflicts, the scheduling was made the responsibility of the operations section of DPW.

The DPW has developed an organization that has the means and ability to respond to conflicts that arise from changing land use. For example, the South of Market area (SOMA) between 9th and 10th Streets has been rapidly changing due to its transformation into a late night entertainment/restaurant area. This has prompted shifting the street cleaning schedule from the night shift to a later period (4:00 to 6:00 AM). DPW responds to incremental land use change as an observable trend takes shape, to avoid conflicts in street use

All residential streets in San Francisco are cleaned on a scheduled basis, a minimum of once a week. Neighborhood commercial areas are cleaned two to three times a week, and the downtown areas are cleaned on a daily basis. Arterials and major thoroughfares are swept several times per week, depending on the location.⁽⁹⁾

San Francisco's particular seasonal and wind pattern characteristics affect street cleaning. It impacts the cyclist, particularly along the Great Highway, with wind blown debris. The north and west sides of streets are generally dirtier than the south and east sides due to wind patterns. On the Great Highway, accumulated sand is cleaned on a regular basis, except in the windy months of April, May and June. During these months, a 12-ton front-end loader and extra crews are needed to pick up 12 tons of sand that get blown across the highway, mostly on the southbound lanes between Lincoln and Sloat Street. The Golden Gate National Recreation Area (GGNRA) requires, that the City collect and return any large amounts of blown sand back to the beaches.

The DPW cleans all of the streets in the City except for the streets, trails, and paths in the City's parks, which are maintained by the Recreation and Parks Department. The cost of street cleaning in the DPR comes from City's General Fund. The budget for repair, however, comes from the gas tax, and DPW is responsible for the repair of all auto-related streets in the City, including those in the parks.

⁽⁹⁾ The DPW's street cleaning system uses a master routing plan. It is a composite routing schedule map of the entire city which is broken up into 25 different cleaning route zones. The DPW identifies each day's cleaning assignments throughout the City. The assignments are color coded to indicate the different time shifts when the cleaning is to be done. The DPW is careful to assign one side of the street on a separate day from the other side of the street to reduce the impact of reduced parking on the street's residents.

A change of either day or time period for street cleaning has to go through public hearings. A schedule is then posted on street signs to inform the public. Public hearings allow the public to provide input into this process. For a city as large as San Francisco, there is an average of at least one hearing per week, and sometimes as many as two or three. These hearings create great public interest because the issue involves on-street parking restrictions.

Street cleaning occurs during four time periods, indicated by four color codes:

- ▶ The night shift - usually for the downtown commercial areas;
- ▶ Early morning from 6:00 to 8:00 AM;
- ▶ 8:00 AM to 12 Noon for those areas adjacent to a commercial strip; and
- ▶ 11:00 AM to 3:00 PM for primarily residential areas.

This scheduling information is placed into a daily Route Book for the maintenance workers who pick up their daily assignments from the dispatch office.

The DPR maintains one vacuum sweeper, and is responsible for the cleaning of streets within all of the City's parks. There is no schedule, but cleaning is scheduled around events. Most of the cleaning is done in the early morning hours to avoid conflict with the park's users. If asphalt work is required for repair, funds are work-ordered to DPW or contracts are let with private firms. All of the cleaning scheduling and repair is done through the DPR maintenance department.

It is important to recognize that overall citywide street cleaning is a continuous 24-hour program that has been established through many years of trial and error. It appears to be responsive to a public input process and has an institutional ability to adapt to incremental changes in land use should conflicts arise.

Existing bikeways maintenance is part of the maintenance of the present street and park trails system in the City. However, as bikeway facilities are expanded and improved and as the bikepath design facilities are incorporated into the City's existing street system, special measures may need to be taken in addition to the existing maintenance program.

City's Street Repair Program - At present, 85 percent of the potholes identified to be repaired are reported by citizens. Fifteen percent are identified by street and sidewalk inspections, reported on Bureau of Engineering forms. A high percentage of the latter reports are issued as a part of insurance claims against the City. The present street and sidewalk inspection staff processes approximately 10-12 reports filed per week. A citizen's complaint made by phone is usually responded to within 24 hours. Fifty percent of the pothole problems are sewer-related. The City has miles of old sewer pipes under the streets. Leakage at the joints weakens the soil below the surface of the road at that point. Recurring potholes are a symptom of this problem.

City's Resurfacing Program - Streets are typically resurfaced every 20 to 25 years. More frequently used arterials are resurfaced every 10 to 15 years.

The City is divided into several districts. The districts are reviewed in rotation by City staff to determine which streets will receive maintenance, repairs or resurfacing. The review system is flexible. Needed repairs can be made when required, before the next scheduled resurfacing date.

Chapter 4 presented recommendations on utilizing the existing resurfacing program for improvements to recommended bike routes.

Utility Covers, Grates, Railroad Tracks, Pavement Types - Utilities or private companies who install utility trenches across a street place steel plate covers over the trenches. If care is not taken to provide a transition between the cover plate and the street surface, this abrupt change of road surface can create safety problems for bicyclists.

The City requires transitions using MC3 cutbacks, a cold mix asphalt. DPW requires permits from utilities and private companies and inspects their work. A standard transition for a 1-1/2" steel plate is 1'-6" horizontal slope distance, with proportionately less horizontal distance for thinner plates.

Cover plates at heavy traffic areas are wedged to provide resilience. The standard for this installation is to cover the wedge within the transition asphalt. Non-skid surfaces that are safe for bicyclists do not wear well. Therefore plain surfaces are typically used.

Railroad tracks that are no longer used and are flush with the road surface are paved over with one-half-inch on top. An example is the Embarcadero Beltline tracks. If the track protrudes above the road surface, the removal is handled by the DPW, Bureau of Engineering. There are countless abandoned railroad tracks that should be removed due to the potential danger to bicyclists. A list of some locations for railroad track removal is contained in Table 8-1. Existing railroad and trolley tracks that are still in use can be made safer by installing rubberized surfaces adjacent to the tracks. It is recommended that rubberized surfaces be installed across all active tracks to improve safety for bicyclists. Diagonal crossings should receive priority treatment as they pose the most difficulty for bicyclists.

There are 68,000 catch basins in the City. The older storm sewer grates are semi-circular with bars parallel to the direction of travel. These are being replaced by grates with bars perpendicular to the direction of travel to improve safety for cyclists. Others are being retrofitted by the addition of perpendicular bars. This program is under the direction of the Bicycle Coordinator. An important part of this program is the inspection of retrofit work to see if the resultant modified grates meet with the safety standards established for this procedure.

Chip seals are no longer acceptable to the City of San Francisco because in time, 25 percent of the gravel is lost through the wear and tear of traffic. A chip seal is the placing of a layer of oil over the exposed surface of a pothole or depression, filling it with a mixture of gravel and sand, tamping it, and sealing it with a final top coating of oil. The City repairs potholes by filling the hole with asphalt to the level of the surrounding surface, and no higher. It is compacted to prevent future settlement and is then inspected for quality compliance.

The existing street composition varies in the City depending on when the streets was originally built. Typically, City streets have an 8-inch concrete base overlaid with 2 to 4 inches of asphalt. A rough estimate would be that approximately 60 percent of the City's streets have a concrete base. Re-surfacing is usually done from March 15 to November 15, which is the dry weather season. The crack sealing and patching of potholes is done year around.

Standard Requirements for Contract Work - An important step, and requirement, towards improving the current conditions of road maintenance done for the city through privatized contract work is to develop a set of standards that must be strictly adhered to with a guarantee of one year for replacement of any defective work. A pre-qualification of acceptable contractors who do this work would go a long ways to ensuring quality, acceptable work.

City's Spot Improvement Program - In 1993, a "Spot" bicycle improvement program was initiated to identify and implement various bicycle-related improvements. Small scale bicycling problems are largely identified through the process of postage-paid mail-in postcards which are distributed through bicycle organizations and bicycle shops in the City. This program is handled by the City's bicycle coordinator in the DPT. The program, though successful, is limited by the lack of sufficient staffing. Since its initiation, approximately 150 responses have been received. The more complicated problems requiring further field investigation require time and resources not always immediately available. The suggestions received by mail are logged into a data base and sorted by type of repair requests. The repair work is then accomplished by DPT or DPW, with DPT as the lead department.



Table 8-1

SUGGESTED LOCATIONS FOR RAILROAD TRACK REMOVAL
San Francisco Bicycle Plan

- ▶ Marina Boulevard at Laguna (Ft. Mason Entrance)
- ▶ Buchanan Street at Beach Street
- ▶ Northpoint at Mason
[Mason between Northpoint and Francisco]
- ▶ Embarcadero at Northpoint
- ▶ Embarcadero at Bay
- ▶ Embarcadero from Beach to Berry Street
- ▶ 9th Street from Brannan to Folsom
- ▶ 10th Street from Bryant to Brannan/Division
- ▶ 3rd Street at 16th Street
- ▶ Berry from 2nd Street to 3rd Street
- ▶ Potrero at Alameda
- ▶ Harrison from 22nd Street to 16th Street
- ▶ Army Street at Vermont
- ▶ Marin at Bayshore and Jerrold
[Evans at Army]
- ▶ Evans at Toland
- ▶ Army from Indiana to Minnesota
- ▶ Bayshore at Visitacion Avenue
- ▶ Market at 11th Street

Source: SF Bicycle Advisory Committee
Funding Subcommittee/Bike Route Task Force

Wilbur Smith Associates; November 1994

Summing Up

The City's streets can be made safer for cyclists. Through its present street and sewer inspection program, citizens' reports and pilot spot improvements programs, the city has a level of street maintenance standards that responds to the needs of largely auto dependent public community. A sub-standard road surface may seem to the auto users as a nuisance condition; whereas, the same condition to the bicyclist is far more critical or may even be life threatening. It is because of this distinction that the following recommendations are made for further study and deliberation by all representatives of the community and transportation related city agencies and departments.

Need for a Higher Standard - In order to ensure bicyclist safety, a higher standard for road maintenance than what now exists is called for. To create it, a public awareness of the needs for higher standards must be developed. This report is the first step of that process, and specific recommendations for maintenance standards are presented in the next section.

Public commitments will then have to be made to develop the necessary mechanism and support required for implementation. Having made a major shift in public awareness and institutional support, we will have gone a long ways in establishing a climate not only for carrying out the design of new bicycle-friendly street facilities, but set the stage of improving our street maintenance standards. Standards that will establish San Francisco as one of the nation's large metropolitan urban centers that have pioneered the conditions that will make its streets also truly accessible to alternative forms of transportation, backed up by higher standards of safety and design amenities for its public.

Accepted Streets - All streets proposed as part of the Recommended Bikeway Network should be accepted upon adoption of this plan. The City should not require fronting property owners to bring them up to code. Rather, the presence of a bicycle route should be added to the list of reasons to accept streets even though they may be deficient in some physical features. The City will be responsible for the physical condition of the surface of these streets, thus, it must maintain them. The overriding reason for a street's acceptance⁽¹⁰⁾ should be its designation on the Citywide bikeway network.

A Built-In Monitoring Mechanism - The previously recommended committee to include representatives from DPW, DPR, DPT and the bicycle coordinator will also improve interdepartmental coordination regarding any maintenance problems on San Francisco's streets, including designated bikeways. Maintenance or street cleaning issues that are ongoing will have a better chance to be aired and prioritized and monitored for implementation. Also the City's bicycle coordinator can also be alerted and updated to potential changes in transportation patterns that affect the City's commuter and recreational bike riding community.

Reinforce and Expand Spot Improvement Program - Maintaining and expanding this program will enable problems to be directly addressed by avoiding bureaucratic hassles.

⁽¹⁰⁾ *Unaccepted Streets Surveyed for Acceptance*, Executive Summary, Civil Engineering Division, SFDPPW, November 16, 1994.

Maintenance Standards Recommendations

Street Cut Improvements:

- Mark all open street cuts with barriers, or cover with two inches of asphalt.
- Bring all street cuts flush to the adjacent surface. When a street is re-surfaced with an asphalt overlay, the existing asphalt in the area adjacent to the gutter lip should be ground to the depth of the asphalt concrete to be placed on the street. Temporary asphalt ramps can be installed at all wedge cuts located at intersections, pedestrian and bike crossings to provide a transition at the vertical differential. In addition, when the asphalt concrete is finally placed on the street, the level of the asphalt should match the level of the gutter within a 1/4-inch to eliminate the edge that can be unsafe for bicyclists.
- Steel plates used to cover work in progress often shift position under the heavy movement of trucks and buses, leaving dangerous gaps. Being an inch or so thick, the plates themselves also present a hazard since the sharp, square edge lies above the street level. Bicyclists risk damaged rims, punctured tires, and rough rides that can throw a rider from the bike. Solutions to this are to use only steel plates with no-skid surfaces and to use only steel plates with beveled edges or to build up all sides with asphalt (which must be replaced and renewed frequently).
- Steam from underground pipes melts the asphalt around steam manhole covers, causing warped pavement. Maintaining heat resistant concrete pads of at least a three-foot radius from the edge of the cover should stop warping of the asphalt near the edges. If possible, install concrete above submerged steam pipes where applicable, to prevent humping of street surface.

Paving, Patching

- Asphalt pavement replacement must be flush with surrounding pavement, including any adjacent concrete gutter. It must be inspected up to one year after installation to check for settling, and be resurfaced if defective.
- Patching operations often leave loose asphalt materials on the shoulder, where larger particles often adhere to the existing asphalt concrete surface, causing a very rough surface. Fresh, loose asphalt materials should be swept off the shoulder before they have a chance to adhere to the shoulder pavement.
- It is important that contractors and utilities be held to strict standards regarding annual repatching and replacing of defective asphalt patches. They should in addition, be required to guarantee their work for a minimum of one year. The City of Palo Alto's strict policy on compaction and smoothness standards for their streets is presented in Appendix G. A similar policy should be adopted by San Francisco.

Striping, Pavement Legends and Edge Line Markings

- Certain types of striping can be dangerous to bicyclists when wet. Non-skid surface should be employed on all traffic lane lines. The use of pavement marking tape for bike lane legends reduces safety risks as it is less slippery, and much thinner than thermoplastic. It also requires less maintenance, lasts longer, and is more cost efficient than paint and thermoplastic.
- Edge lines should not be supplemented with raised pavement markers which present problems for bicyclists. Where edgeline raised reflectors are needed for motorists, they should be installed on the motorists' side of the fog line.

Roadway and Shoulder Sweeping

- Broken glass, gravel and rubble along the roadside are dangerous to bicyclists and cause punctured tires. Maintain a minimum of a weekly sweeping schedule in addition to sweeping bikeways whenever there is an accumulation of extraneous materials (gravel, glass, sand) on the bikeway.

Catch Basin Grates/Utility Covers/Railroad Tracks

- Parallel-bar sewer grates have openings that can catch and destroy a wheel rim and cause a bicyclist to be thrown from the bicycle. Many bicyclists also swerve to avoid the grates, risking collision with motor vehicles. Street, sewer and storm drainage grates should be oriented so that the bars are perpendicular to the direction of travel, to create bike-safe grates. Low catch basin grates should be raised to the proper pavement elevation to improve bicycle safety and enhance smooth riding.
- Utility covers must be flush with surrounding pavement.
- Curbs and gutter upheavals cause hazardous ponding in bike lanes. A regular inspection of every linear foot of curb and gutter should identify those that are raised, sunken or that have some vertical differential that would cause ponding, and these should be repaired.
- Sometimes small asphalt dams are constructed on highway shoulders to divert storm water into catch basins. These represent a real hazard to bicyclists and should not be constructed on shoulder bikeways.
- Railroad tracks crossing should be rubberized, with priority going to those at a diagonal to the bicyclist's direction of travel.

Bicycle Pathway Maintenance System

- A Bicycle Pathway and/or Pavement Maintenance System should be a part of a computer database which can provide reports on the current condition of every bicycle lane or pathway in the City. This should be kept updated through regular street condition surveys. A computerized system will enable identification of priority maintenance needs throughout the City.
- A signing/lighting plan is needed for all maintenance activities on the City's bike paths and bike lanes. Advance warning of maintenance work should be given and designation of a detour route should be considered.

BICYCLE REGISTRATION

San Francisco currently has no bicycle registration program. This section discusses the feasibility and probable effectiveness of adopting such a program.

As used here, the terms "registration" and "licensing" refer to records of bicycle ownership maintained according to Division 16.7 of the Vehicle Code. There are no provisions in California - or elsewhere in the United States, for that matter—for qualification and licensing of bicycle operators.

Purposes

The main purposes of bicycle registration are deterring bicycle theft, improving recovery of stolen or missing bicycles, and aiding in the apprehension and conviction of bicycle thieves. Registration may also have incidental purposes such as identifying the victim in an accident. The current system, authorized by the California Vehicle Code, is, however, largely ineffective.

Under this system, the Department of Motor Vehicles issues numbered registration stickers to cities and counties. City or county participation in the program is voluntary. Local programs may be either mandatory or voluntary for bicyclists, and non-residents cannot be regulated. Penalties for failure to register are low, and the chance of detection is slight. Thus an unknown but probably small fraction of bicycles in California are ever registered.

Weaknesses of the Current System

Unlike automobile license plates, which are visible at a distance, bicycle registration stickers can be seen only upon close inspection. Bicycle serial numbers are even more difficult to find, identify, and read than registration stickers. Their location varies from manufacturer to manufacturer, they are not always unique to all manufacturers, and they identify only the bicycle frame.

Aside from the chance recovery of bicycles that are suspected of being stolen for reasons unrelated to registration, those that are abandoned, or those whose riders are stopped for other offenses, the registration system can detect a stolen bicycle only if it is presented for further registration. This is unlikely to happen. If it does, no proof of ownership is required; the previous registration cannot

be checked conveniently; the old registration sticker can easily be removed; and the stolen bicycle can be further disguised by removing its decals and re-registering it under a different brand name.

Stolen bicycles can easily be transported far from the point of theft. But because there is no broad, accessible database of registrations, it is nearly impossible for police officers to readily determine whether a bicycle has been stolen. To identify a registration, a police officer must call the Department of Motor Vehicles in Sacramento during business hours to determine which city or county received the registration sticker; locate the local licensing agency, which may be the police department, the fire department, or a bicycle shop; call this agency to find out where records are kept; and then request a search of the records. This search is usually manual, since few records have been computerized. This cumbersome procedure is feasible only for a bicycle in custody; it cannot be performed on the spot.

If a stolen bicycle is recovered, the system is often unable to identify or locate the owner. Many of these recovered bicycles are of poor quality, and some are not even claimed. Such bicycles were usually poorly locked or unlocked and were taken by casual thieves. When high-quality bicycles are stolen, on the other hand, they, like expensive automobiles, are often taken by professional thieves and disappear permanently, as described in Chapter 7, "Bicycle Parking, Building and Transit Access."

Characteristics of a More Effective System

A registration system that discourages bicycle theft by making it either risky or poorly rewarded would probably resemble the title registration now performed for automobiles. Most of the following characteristics would be essential to an effective system:

- Because travel either on or with a bicycle is so easy, it is not feasible to implement such a system locally. It would have to apply to all bicyclists statewide (preferably nationally), at least for adult bicycles.
- Mandatory registration would be the most effective system for identifying stolen bicycles, which could otherwise be disguised as legally unregistered ones.
- The system should record the owner of every bicycle at sale or when it was brought into California, and authorize every transfer of ownership. Registration should be automatic at sale and convenient thereafter.
- Registration records should be regularly transferred to a statewide database.
- This database should be readily accessible to law enforcement agencies in order to determine ownership, preferably in real time and at all hours, and would by necessity be computerized.
- The database should be maintained by a government agency, possibly the Department of Motor Vehicles. Two private companies currently offer registration services to bicycle owners. However, private registration cannot guarantee security, accessibility, and indefinite maintenance of the data.

- Law enforcement agencies must be willing to enforce registration laws and to use the database.
- To facilitate maintenance of the database, there should also be a procedure for purging records of abandoned or discarded bicycles.
- Bicycles would need to be uniquely identifiable at registration. The best system would employ unique, uniformly located serial numbers, similar to the Vehicle Identification Numbers now used by automobiles. Such a system would require changes in manufacturing practices.
- If the program is to have maximum effectiveness, it would be helpful for bicycles to be uniquely identifiable on sight, as automobiles are by license plates—if only to establish that they had been registered. This visual identification would also have benefits for traffic law enforcement and the apprehension of fugitives who use bicycles in crimes.
- Since the framework for bicycle registration is prescribed by statute, such a system would require extensive changes in state law. It would also work more effectively if manufacturing practices were modified to provide unique serial numbers to every bicycle independent of manufacturer.

Disadvantages

The cost of administering such a comprehensive system would probably be considerably more than the value of the bicycles recovered. It could not be financed practically through registration fees (currently limited by state law to \$2 a year), since substantial fees would discourage either compliance or cycling, especially among low-income cyclists. Furthermore, if a mandatory program were to be meaningful, there would have to be a penalty for failure to comply. Any penalty, even if it were only payment of the fee itself, could also discourage bicycling.

Given the cost, the state would be better off simply insuring bicycles against theft. Moreover, there is no obvious analogue of license plates for bicycles.

Even more important, any such restrictive system is likely to meet with resistance on civil-liberties grounds from cyclists who fear the prospect of police harassment to enforce compliance, or compliance enforcement as an excuse for harassment.

Alternatives

If San Francisco decides to adopt a registration program, it should first decide its preference for either local or statewide bicycle registration. If the preference is for a statewide program, the City should pursue appropriate action by the Legislature.

Under the current statewide program, registration is mandatory in some California cities and optional in others. San Francisco bicyclists seem to have a clear preference for optional registration. In most cities there is also a small fee, but in the City of Santa Ana registration is free and compliance has increased dramatically. Given the relatively low administrative costs of registration,

San Francisco should also adopt this policy. The City should not, however, contract with a private company, since private registration cannot guarantee security, accessibility, or indefinite maintenance of the data.

There is a less expensive, easier, and probably more effective way to recover stolen bicycles than through bicycle registration, by using existing mechanisms for marking valuable property, recording serial numbers, and tracking stolen goods. Penal Code §11111 requires the Department of Justice to maintain records of lost and stolen bicycles in the Criminal Justice Information System, and for these records to be accessible to all authorized law enforcement agencies through the California Law Enforcement Telecommunications System (CLETS). This method would also benefit from modified manufacturing practices that provided unique serial numbers to every bicycle, independent of manufacturer.

It is recommended that the SFPD utilize this existing system of tracking stolen bicycles and that all bikes reported as stolen be entered into CLETS. In addition, the San Francisco Bicycle Coalition's action plan to combat urban bike theft should be embraced by the City (see Appendix G).

Whether or not registration is instituted, one of the best ways to deter bicycle theft is to provide bicycle parking facilities secure enough to make theft difficult, numerous enough to be readily available, and convenient enough to be attractive to bicyclists.

TRAINING FOR CITY ENGINEERS AND PLANNERS

Although the City of San Francisco has a bicycle coordinator position, no single person can handle all the issues that affect bicycling in the City. Even if the bicycle staff were expanded, issues would still arise within the Departments of Planning, Public Works, Recreation and Parks, and Parking and Traffic that affect the planning, construction, or maintenance of bicycle facilities, not to mention the other roads and paths on which bicyclists ride.

All San Francisco engineers and planners should therefore be trained in the needs and concerns of bicyclists, to make them aware in their daily activities of issues that affect bicycles. This training is especially important because most university civil engineering and city planning curricula all but ignore the bicycle,⁽¹¹⁾ and on-the-job training must fill the void. Such training would improve safety and maximize the use of bicycling as an alternative mode of transportation. In particular, training for city planners and engineers would help to ensure that:

- All roadway projects (including construction, restriping, resurfacing, rehabilitation, and maintenance) consider the impacts on bicycling.
- All new planning maximizes the potential for bicycling (and walking).

⁽¹¹⁾ The University of Washington offers a Human Powered Transportation class in its civil engineering department. CSU Chico also offers a course in bicycle facility, design and planning. In addition, the American Society of Civil Engineers (ASCE) Subcommittee on Human Powered Transportation has developed a suggested class outline for a two-hour college bike transportation lecture. Federal Highway Administration Case Study No. 2 presents a syllabus for a graduate course or a continuing education course on non-motorized transportation.x

- The design of new roadways and bike facilities meets minimum standards, and exceeds them wherever feasible.

These objectives for training are consistent with the objectives of the Transportation Element, which include ensuring that bicycling can be used safely and conveniently as a primary means of transportation.

To be most effective, the training efforts should be targeted at three categories of employees:

- ▶ Transportation planners and engineers
- ▶ Other city planners and engineers
- ▶ Department heads

Transportation planners and traffic engineers are most likely to encounter bicycling issues and would require more intensive training than others. For them, a one-day or two-day course would be appropriate. Other city planners and engineers would require different training emphasis. For these city planners and engineers, an annual in-house seminar would be enough, along with written materials to be handed out at the session. Alternatively, brown-bag seminars attended by planners and engineers as well as the bicycle coordinator could be held monthly to discuss current issues.

Finally, a one-time two-hour presentation or written materials (or both) would be effective for department heads to raise their awareness of bicycle issues and to inform them of the strides other cities have made. This presentation should be updated at least yearly. It would be appropriate to include city officials at such a presentation, since to be most effective, bicycle-friendly policies must have political support. A bicycle ride to show department heads and city officials the real problems encountered by bicyclists on City streets would also help to educate them about bicycle safety issues.

The Federal Highway Administration, the Bicycle Federation of America, and the Traffic Institute of Northwestern University offer classes on bicycle facility planning and design. These classes are targeted toward those who are responsible for planning, operating, and designing bicycle facilities and programs. Nevertheless, those with less than primary responsibilities would also learn a great deal about bicycling and bicycle issues by attending. These courses generally last three to five days.

In addition, the Institute of Transportation Studies (ITS) at U.C. Berkeley offers a course on "Fundamentals of Traffic Engineering." This course does not currently address the bicycle issues that are the focus of the desired training, but it is possible that it could be modified. It is also possible that ITS or others could add a course on bicycle transportation within a year or two. Finally, the San Francisco Regional Bicycle Advisory Committee (REBAC) is considering the development of a course to offer to cities and counties for their traffic engineers and transportation planners, possibly as soon as 1995.

There are no existing programs, courses, extension courses, or syllabuses specifically targeted to professionals whose ancillary responsibilities include bicycle issues. Several papers written for presentation at Institute of Transportation Engineers and Transportation Research Board conferences may be useful as education materials for those engineers and planners (Appendix G). They can also take advantage of existing educational opportunities by enrolling in one of the more specialized extension courses described in the previous paragraph. Because of this shortage of courses, brown-bag seminars may be the most feasible way to train city engineers and planners, in addition to reading the material cited in Appendix G. For city officials and department heads, the

bicycle coordinator, or the coordinator's supervisor, should prepare the presentation and lead a bicycle ride.

SUMMARY OF RECOMMENDATIONS

- Amend the Transportation Element of the Master Plan as recommended.
- Amend the Traffic Code to delete superfluous and contradictory definitions and regulations.
- Revise the Traffic Code to eliminate the reference to age in section 96, and allow adults as well as children to ride on sidewalks in residential areas.
- Allow sidewalk riding in certain non-residential areas and add language to traffic code governing the behavior of bicyclists with respect to pedestrians.
- Re-evaluate the regulation of bicycle messengers.
- Refine language in the Traffic Code regarding parking of bicycles on sidewalks and roadways.
- Request that the Legislature amend the Vehicle Code so that:
 - ▶ Bikes can be exempted from regulatory signs (such as: Do Not Enter) at local discretion.
 - ▶ Bikes can travel in bus-only lanes.
- Adopt new ordinances:
 - ▶ Establishing all bike lanes on the Master Plan in toto, not individually, (and as thereafter amended).
 - ▶ Requiring showers in new buildings.
- Adopt a comprehensive program to deter bicycle theft and recover stolen bicycles without mandatory registration.
- Adopt new policies:
 - ▶ Encouraging bicycle travel by City employees.
 - ▶ Recognizing bicycling as an equal mode in the Transportation Element and in the Guidelines for Environmental Review.
 - ▶ Making other changes to put bicycling on an equal footing with other transportation modes.
 - ▶ Requiring City engineers and planners to receive training on the issue of bicycle transportation, and bicycle facility planning and design.
 - ▶ Utilize the existing registration and CLETS programs to assist in enforcing bicycle theft law. Encourage a mandatory state-wide registration program be implemented.



9. EDUCATION AND ENFORCEMENT

INTRODUCTION

This chapter presents an overview of bicycling safety/education programs. It presents detailed outlines of two programs that the City could implement: the first on children's bicycle safety education and the second on motorists' awareness of bicycle issues. Lastly, this chapter presents a discussion and recommendations for enforcement techniques.

BICYCLE SAFETY AND EDUCATION OVERVIEW

Most of the goals and objectives of bicycle safety and educational material developed in the last 15 years reflect the influence of *A Study of Bicycle/Motor Vehicle Accidents: Identification of Problem Types and Countermeasure Approaches*, conducted by Ken Cross and Gary Fisher. The *Cross Study*, as it has come to be known, was originally published by the National Highway Traffic Safety Administration (NHTSA) in 1977. By identifying bicycle/motor vehicle crash types and the median age of bicyclists involved in each, countermeasures can now be targeted to the age group most affected. For example, collisions between motorists and bicyclists in the road beyond the end of a driveway, identified as driveway rideout, primarily involve child bicyclists. Collisions between on-coming left-turning motorists and bicyclists riding straight through an intersection usually involve adult bicyclists and are a common crash type in college towns.

Child Bicyclists

Most bicycle safety efforts target elementary school-aged children and their parents. Intervention for young, beginning bicyclists between the ages of five and eight is most appropriately focused on parents and the role they play in selecting the proper size and type of equipment, in supervising their child's use of that equipment, and in teaching the basic mechanical skills needed to start, balance, steer, and stop a bicycle. Parents may be reached through parent-teacher associations. One resource for those presentations is *Pedal Programs; A Hands-On Bike Safety Planning Guide*.⁽¹⁾

Before the age of nine, most children do not have the maturity and developmental skills required to ride a bicycle in traffic situations. These include the development of wider peripheral vision, the ability to judge whether an object is moving, which direction objects such as cars are moving in and how fast. For these reasons, children under nine should have direct supervision if riding on the street.

⁽¹⁾ *Pedal Programs: A Hands-On Bike Safety Planning Guide*, Minnesota Safety Council and the Minnesota Extension Service, 1992.
Minnesota Safety Council, Inc., 474 Concordia Ave., St. Paul, MN 55103.

There is a critical window for learning and integrating traffic skills defined by children's development on one end and the age at which they are most at risk for crashes and injuries on the other end. Children between the ages of nine and ten are the optimal target for these interventions which include among others, entering and exiting the roadway; scanning ahead, behind and to the side while riding straight; and communicating and cooperating with other road users.

Adult Bicyclists

There are few materials and programs that focus on the teenage rider or the adult rider. Most of these bicyclists have not had any formal bicycle education in childhood outside of learning the basic mechanical skills. At the same time, there are misconceptions, myths and outdated advice that further challenge adult bicyclists' safety. For instance, some believe a bicyclist should ride facing traffic, and it is still rare to see a bicyclist at night using the required headlights and reflectors.

Safety and Education Programs and Materials

Bicycle safety and education programs and materials for any age bicyclist can be divided into two major types: those that develop awareness and provide information, such as posters, brochures and videos; and those that change behavior and/or develop skills, such as programs with on-bike instruction.

Motorists and bicyclists of all ages share rights and responsibilities for the safe and proper use of the roadways they both use. However, motorists too often do not accord bicyclists respect as legitimate users of the same roadway. By the same token, some bicyclists do not observe the rules of the road, endangering themselves and others through reckless movements in traffic.

"Life-Cycle" Program - Most of the successful bicycle education programs in the United States have been public-private partnerships. This concept involves the grass-roots bicycle organizations in a pro-active role within established programs conducted by public agencies. A full "life-cycle" program of education might consist of the following elements:

- **Kindergarten Through Third Grade** - Pedestrian and bicycling safety education/safety training (Florida DOT has developed pilot programs; The Institute for Rehabilitation and Research, TIRR, has produced a bicycle helmet video and is promoting it to area PTOs; Triametic has produced a video entitled, *Bicycle Safety Camp*).
- **Fourth and Fifth Grades** - *Basics of Bicycling* curriculum (developed by Bicycle Federation of America) or other classroom/on-bike program.
- **Middle School and High School** - Focus on sports and recreational uses, touring, racing; conducted by volunteer cycling advocates.
- **Local Universities** - Promote cycling on campus, introduce effective cycling as physical education course (similar to racquetball, tennis, etc.).

- **Adult Bicyclists** - A modified version of League of American Bicyclists (LAB) Effective Cycling course would serve the public need for cycling education, offered at bike shops and community centers; promotional events such as Bike to Work Day, and Bicycle Houston Week also serve education needs.
- **Motorist Education** - Emphasize sharing the road techniques and add bicycle awareness to the Department of Motor Vehicles' *Driver's Manual* and all state and private driver education courses. State of North Carolina includes a *Driver's Manual* chapter on *Sharing the Road*.
- **Public Awareness and Bicycling Encouragement** - Outreach to non-English speaking adults; helmet promotion campaigns; outreach to parents of child bicyclists through speakers at parent-teacher organizations.

The initial bicycle education programs should concentrate on addressing the most effective intervention opportunities.

EDUCATION PROGRAMS

Children pose a special safety problem as they learn to ride bicycles. Learning to ride by the rules, look for traffic and use hand signals are not second nature—these skills must be taught. To avoid mishaps, the building blocks for safety must start early, as children learn to ride.

The following Education Plan is divided into two programs for the two distinct audiences:

- **Children's Education Program:** To provide school-age children with a strong foundation for safe bicycling,
- **Motorist/Cyclist Education Program:** To promote the safe sharing of roadways between motorists and cyclists.

CHILDREN'S EDUCATION PROGRAM

Case History

The Bicycle Federation of America (BFA) has produced a curriculum for elementary level bicyclist training entitled *The Basics of Bicycling*, with assistance from the North Carolina Bicycle Program and Bikecentennial.⁽²⁾ The program has been piloted and subsequently expanded in the Alamance County School System (North Carolina). According to Mr. Alec French, Health Educator for Alamance County Schools, the program has been well received by students and parents in the pilot schools, and they are expanding the program to include all 12 elementary schools in the district. The program is gaining a reputation as one of the best bicycle education curriculums in the country.

⁽²⁾ Now *Adventure Cycling*.

The program curriculum, available through BFA, consists of an instructional videocassette tape and an instructors' manual. The program is targeted at fourth and fifth graders and requires seven class periods; the first two for in-class lessons, and the last five for on-bike lessons. In Missoula, Montana, teachers have the kids bring their own bikes and helmets; in Bartow, Florida, the school district provides bikes and helmets that are time-shared and transported from school to school by the "Bike-Bus", a modified school bus. Donations of bikes, helmets, and bike upkeep may be sought from a myriad of sources. Volunteers can assist in special instructions, setting up courses, fitting helmets and bikes, and assisting with on-bike instructions.

Objective

The objective of the Children's Program is to provide school children with a strong foundation for safe bicycling practices. The children who participate in the program will be given specific strategies—such as traveling with the flow of traffic, making turns at busy intersections and avoiding road hazards—to ride their bicycles safely. Graduates of this educational program will be imbued with the knowledge and confidence needed to operate a bicycle safely in the City of San Francisco.

It is acknowledged that this safety education program will reach only a small fraction of San Francisco's school children. A more intensive program to reach all school children would require the commitment of the San Francisco Unified School District or the State of California. Still, providing safety education for the children and their parents who want it should be considered a public service and should be given high priority.

Education Strategy

After researching and assessing existing educational programs geared towards children, we feel that the following three components will be needed to make the proposed plan successful:

1. **An Action-Oriented Teaching Approach** - Learning must take place on a bike rather than in a classroom-like setting. When each child is on his/her own bicycle, it will allow them to learn safe/riding techniques more readily than by a classroom presentation alone.
2. **A Repetitive-Practice Teaching Process** - Sessions will emphasize a short list of concepts at each session and will repeat them for reinforcement. Riding a bicycle under the supervision of an instructor on numerous occasions will increase the students' level of comprehension and retention.
3. **A Sense of Accomplishment for Completing the Program** - Rewards in the form of discounts for bike-related goods and certificates of completion will be handed out at the end of the program. Incentives for completing the program will not only boost the initial interest in the plan but it will also help to keep children interested throughout the four-week course.

Tactical Recommendations

Program - A four week program of three two-hour weekly learning sessions and one bicycle rodeo will be designed to give participants hands-on knowledge of how to travel safely throughout the City of San Francisco on a bicycle. The program is also designed to promote bicycling as a fun activity for youths, who in the future could choose bicycling as a transportation alternative. It is timed to coincide with the conclusion of the proposed "San Francisco Bicycle Safety Week" (see Motorist/Cyclist Plan) in June.

Target Audience - The Children's Program will target elementary school age children in San Francisco. This age range —third through sixth grades—will reach children who are still in the formative years of bicycle riding. Even within this limited age span, a fairly wide range of bicycle ability among the participants will exist; the children will probably need to be broken into two groups due to the difference of aptitude. Staff will need to work with the San Francisco Unified School District as well as with private schools to promote the program in the elementary schools.

Sponsors - To maximize impact, sponsorship should be sought from companies that provide public service, manufacture bicycle equipment, and provide health care, as well as retail bicycle stores. Examples of the kinds of sponsors which could be interested include:

Media Sponsor - A media sponsor, such as a local newspaper, television or radio station, is vital to the success of the Children's Program. The media sponsor will provide the program with much needed publicity. A sponsor of this nature will be able to reach a wide audience and provide the following:

- ▶ Generate interest among children to participate in the program.
- ▶ Generate positive coverage for the organizers of the Children's Program, which will attract other companies to serve as a sponsor.
- ▶ Provide a relationship with the media which could lead to Public Service Announcements (PSAs) on bicycle safety.

Health Maintenance Organization/Local Hospital - A Health Maintenance Organization (HMO) or a local hospital could serve as an underwriter of the campaign for administrative costs. The main cost would be working with the local bicycle store to pay for bicycle equipment for the children who complete the program.

A health care company will see this as an excellent opportunity to align itself with a healthy activity that's targeted at children.

Since the program will be for the children of San Francisco, one of the City's hospitals will be able to promote safe bicycle riding practices. In turn, the hospital won't be seeing the program's participants in their emergency room as a result of a bicycle accident.

Bicycle Helmet Manufacturer - By aligning itself with a bicycle helmet manufacturer, the program will be able to generate interest among parents who are purchasing helmets for their children. In return for some media coverage, the manufacturer might be willing to donate helmets to the children who participate in the program. With the recent California legislation that all children must wear helmets when biking, this is a program that will interest the manufacturer.

Local Bicycle Store/Equipment Manufacturer - The Children's Program will be able to attract participants through advertisements in local stores. The stores can also donate prizes and redeem coupons for bicycling equipment. In return for their sponsorship, the store will be establishing itself as a bicycle equipment supplier to the program's participants and their parents.

Instructors - For the children to get the most out of this safety program, a student-to-instructor ratio should be targeted at 8 to 1. With this 8:1 ratio in place, each child will have the opportunity to have a good level of interaction with an instructor. The San Francisco Police Department produced a bicycle rodeo in 1993 which used this 8:1 ratio, with 150 participants and 18 teachers.

Despite the fact that this project is an educational program, it will not be implemented in conjunction with the San Francisco Unified School District. It has been the experience of the San Francisco Bicycle Advisory Committee that the school district historically has not been interested in and/or able to institute a bicycle safety program. The financial hardships faced by the school district also play a part in the decision to develop the Children's Program independent of the School District. However, it should be a goal of the City to include more bicycle safety instruction in the school curriculum, and this should be the subject of another study.

A cooperative team approach to staffing the learning sessions will pull together trainers from groups already prepared to teach bicycle safety. These instructors will be asked to volunteer their time to train and teach. The program will be taught in conjunction by:

- **An Entity of the San Francisco Police Department** - The San Francisco Police Department is ideally suited to lead the children's safety program. This educational program will expand on existing police traffic safety and bicycle registration programs to produce the four weekly educational sessions that will culminate in a citywide bicycle rodeo. The Police Department contact is Officer Jim Miranda of the Safety Patrol.

The Police Activities League (PAL) is a volunteer group of police officers which sponsors local youth activities, providing both leadership and financial backing. Staff will need to write a letter describing the Children's Program to the PAL Board of Directors so that they can consider participating in the four-week program.

- **Volunteers from the Bicycle Community** - The San Francisco Bicycle Advisory Committee (SFBAC) and the San Francisco Bicycle Coalition (SFBC) are two bicycle groups that could provide the program's participants with practical knowledge of riding a bicycle in the City. Their participation in this program will also provide valuable relationships with the Police Department, with whom they'll be teaching the educational sessions.

The SFBAC is an 11-member group appointed by the Board of Supervisors that advises the City in the development of a plan for bicycle-related improvements. The Committee is staffed by Peter Tannen, Bicycle Coordinator/Planner.

The SFBC is a bicycle advocacy group whose mission is to promote the bicycle for everyday transportation. This organization has a membership of 380 bicycle riders. Staff should contact SFBC's executive director Dave Snyder at 431-BIKE.

Both the San Francisco Police Department and the City's bicycle organizations are the most logical groups to instruct the children in riding safely, since they have expertise in safe bicycle practices as well as practical biking knowledge of San Francisco. Since they will be asked to volunteer their time for this project, these two groups will prove to be the least expensive mode of training. Staff will need to ask these entities for their help.

Promotion - To encourage participation in the Children's Program, staff will produce 20,000 flyers and distribute them in San Francisco's elementary schools. The flyers will describe the program and have a sign-up sheet on the bottom portion. The children will return this sign-up sheet to their school principal. These sheets will be picked up by staff.

Course Length - The plan calls for a four-week program that will meet on Saturday mornings. The first three weeks will be two-hour educational sessions, with the fourth week being a city-wide bike rodeo for graduates of the Children's Program. The rodeo will serve as a graduation of sorts where the children will be able to show what they've learned on their bicycles and will be able to compete against other children their age in cycling events.

The length of the program is perhaps one of the most crucial elements to this education campaign.

It is much more intensive than a one-time bicycle rodeo, and in fact provides approximately the same number of hours of instruction as some of the school district-sponsored curriculums of other states.

Studies have shown that "while videos, flyers, posters, coloring books, assemblies and bike rodeos are effective at introducing traffic safety rules, unfortunately, they have little bearing on children's behavior. Bicycling safely requires physical skills that can best be learned through repetitive practice..."⁽³⁾

Taking this information into consideration, it's imperative that children participate in all three of the educational sessions. The students will learn things more thoroughly since the instructor will be able to revisit some elements introduced in the previous session. The three educational sessions will allow instructors the opportunity to evaluate the level of proficiency each group of riders has reached and, if needed, re-teach some elements. In turn, the children will be able to see their improvement, which will give them a positive feeling about bicycle riding.

⁽³⁾ DiBrito, Roger and Sharon et al., *Left, Right & Left Again*, Volume I, Ride Safe, Inc., Warrenville, IL, 1994

Due to the fact that the program's instructors are volunteers, Saturday mornings are the ideal time for these sessions. This time period also allows working parents to participate with their children and in many cases could re-introduce the joy of biking to the parents.

Location - To include as many children as possible in this program, the plan calls for the three-week educational sessions and the bike rodeo to be conducted at a site that will be able to accommodate a high volume of bicycles.

For the educational sessions, there will be a need for a wide open space that will allow both the instructors and the children enough room to participate in bicycle exercises in a safe manner. With this in mind, local school playgrounds and city parks are the recommendations for these sites, such as Candlestick Park.

School playgrounds not only provide the needed space, but they will also provide a safe atmosphere in which to practice riding without the danger of automobiles.

For the bike rodeo, either Justin Herman Plaza, Crissy Field or Golden Gate Park are the recommended sites for the rodeo.

Justin Herman Plaza is a centrally-located site that is accessible by public transportation. The concern about this site is the size of the area needed to conduct the rodeo. The availability of parking is an issue for those parents who bring their children in an automobile. Staff will need to contact the Embarcadero Center for availability of Justin Herman Plaza.

Another option for the bicycle rodeo site is Crissy Field. The rodeo activities can be safely conducted in the parking lots surrounding Crissy Field. This site is in close proximity to public transportation, while at the same time having adequate parking facilities. Staff will need to contact the Golden Gate National Recreation Area for the availability of Crissy Field.

The San Francisco Police Department's Safety Patrol designed a course in Golden Gate Park for its 1993 bike rodeo. On this course, children rode on streets with some automobile traffic, which could be a positive way for the children to finish their training program. Depending on the ability of the rider, a Golden Gate Park course could be a liability, unless the street is closed. Staff will need to work with the San Francisco Police Department and the Parks and Recreation Department.

Curriculum - Police officers and members of the bicycle organizations will lead these weekly two-hour sessions that will educate children in different safety aspects related to bicycle riding. These sessions will be conducted with an action-oriented teaching approach.

Under this method, each child who participates in the program will be on his/her own bicycle to help augment the exercises they will be taught. This method will prove to be beneficial in many different ways.

- First, as opposed to school assemblies, each child will be able to interact with a bicycle and incorporate what they are being taught into their riding practices.

- Second, the children will be introduced to the fun of riding a bicycle—in a safe manner. Getting children interested in riding bicycles is one of the major goals of the Comprehensive Plan's education component.

Since the instructors have practical bicycle knowledge, staff can work with them to prepare a listing of topics that will need to be addressed in the four educational sessions. Some topics could include:

- ▶ Traffic laws
- ▶ Riding in traffic
- ▶ Making turns at busy intersections
- ▶ Keeping bicycle under control when checking traffic
- ▶ Riding next to parked cars
- ▶ Avoiding dangerous obstacles in the road
- ▶ Bicycle maintenance tips

In the weekly sessions, the instructors will teach the children two or possibly three new aspects of safe bicycle riding practices. They will then have the children practice the new element, while offering one-on-one instruction if needed.

Incentives - Since a four-week program is a serious time commitment, an incentive is required for the children to complete the program.

This incentive comes in the form of a bike rodeo for only the children who have completed the three-week education sessions. As said earlier, this event will be the culmination of their training and will serve as a graduation from the program.

Staff can organize the bike rodeo from materials provided by Adventure Cycling, formerly Bike Centennial. Along with the information provided from these materials and the instructors' previous rodeo experience, the staff will be able to produce an event that will encompass all of the aspects learned in the three-week educational sessions.

The bike rodeo is not only the culminating event for the participants, but it is the event where the Children's Program's sponsors will get the most exposure. With a media sponsor on board, the rodeo and its sponsors will most likely receive some media coverage. The rodeo also provides all of the sponsors a forum to reach their target audience—bicycle riders and their parents -- with their products.

Aside from the bike rodeo, perhaps the biggest incentive for the children to complete the Children's Program is the opportunity to buy bicycling equipment at discounted prices through the help of the sponsors. All rodeo participants will receive coupons for discounted items at the local bicycle store sponsor, while the other sponsors can donate prizes for winners of the bike rodeo.

**Bicycle Safety Education Plan
Children's Program
Estimated Program Budget**

■ **Program Sponsor**

Search, Prize Solicitation and Coordination in Four Categories:

- ▶ Media
- ▶ Bike shop
- ▶ HMO/medical facility
- ▶ Equipment manufacturer

■ **Promotional Flyer**

Design, Development, Distribution and Promotion at Schools

■ **Event Development**

Set up, location arrangements, amenities, banners, liaison with Police Department and Bike Coalition for four events
(3 training sessions and one bike rodeo)

■ **Media**

Develop and coordinate PSAs and promotional messages with media sponsor

Total Labor: **\$34,150.00⁽⁴⁾**

■ **Collateral**

Banners (2) 1,627.50

Photocopy for flyers (20,000 @ .08) 1,736.00

Water stands at 4 events 434.00

■ **Miscellaneous Expenses**

Deliveries, copies, fax, telephone,
postage, authorized local travel 1,800.00

ODC costs @ 17.65 percent 987.96

Program Total: **\$40,735.46**

■ Site rental, insurance to be arranged by the City

■ Site set up, equipment/cones, curriculum to be supplied by the Police Department

⁽⁴⁾ This figure represents labor for two account executives at public relations agency rates, \$100 and \$75, respectively, for approximately 340-350 hours of work.

MOTORIST/CYCLIST PROGRAM

Objective

The Motorist/Cyclist component of the Education Plan is a program designed to promote the safe sharing of the roadways between motorists and cyclists. Bicycle riders and automobile operators share responsibilities for causing and avoiding bicycle accidents.

Accidents involving bicyclists and automobiles are by nature potentially serious. "Dooring"—a bicyclist colliding with the opening door of a parked car—is among the most common accidents in the City of San Francisco, with 86 reported occurrences for the years 1991-1993, according to Chapter 2. Over the same period of time, bicyclists caused 69 accidents by traveling at an unsafe speed for the prevailing conditions. These statistics indicate that both bicyclists and motorists need to improve their cycling and driving behavior.

The goal of the Motorist/Cyclist Program is to educate cyclists about their responsibilities for safe operation of a bicycle and to teach motorists about bicyclists' rights and responsibilities and appropriate methods for sharing the road with bicyclists.

Education Strategy

Mass distribution of the Motorist/Cyclist Program message is the key to the successful increase in awareness of the rules. Many of the existing strategies, such as the AAA *Sharing the Road* video used in high school drivers education classes, and various brochures produced by AAA and others, do a good job of educating new drivers about safe road sharing practices. However, these don't reach a wide enough demographic audience to educate the majority of the drivers on the road.

Tactical Recommendations

The Motorist/Cyclist campaign is designed to reach a mass audience through direct mail which reaches residents at home, a pro-active media campaign to drive awareness and awareness outreach events intended to get people more involved.

Direct Mail/Mailer Add-Ins - An annual mailing of a simple brochure or pamphlet on safe bicycle practices would be included in existing mailings from a variety of agencies and companies. We recommend that the pamphlet to be developed for this purpose be simple black type on colored paper sized to fit into the envelope size used by the groups listed below. The prototype for this mailer could be the "Don't Be A Road Warrior" brochure produced by the Southern Bicycle League and the Georgia Department of Transportation, or the *Don't be a Bubbasaurus/Beastasaurus* brochure produced by the Texas Department of Transportation (see Appendix H).

Partnering with entities such as the Department of Motor Vehicles and PG&E will allow wide distribution of materials at a minimal cost.

For example, the City of Palo Alto works with the local utility company to include information on bike safety in the utility company's billings. The city was able to deliver its message to its target audience, and the utility company is able to provide community service.

Because San Francisco's population is so much larger than Palo Alto, we suggest partnering with different entities to reach as wide ranging an audience as possible. Examples include the following types of organizations:

Department of Motor Vehicles (DMV) - Working with the DMV will allow the campaign to reach drivers—a key target audience for this campaign.

An add-in brochure would be enclosed in the annual renewal notice for automobile registration. This mailing would only go to the owners of cars registered in San Francisco. Since cars need to be registered every year, this would serve as a great way to reach all of San Francisco's car owners on a yearly basis.

The DMV would benefit from participation in this campaign because it will provide them with another way to inform the state's automobile operators about sharing the road safely with bicyclists. There is a precedent for DMV mailer add-ins, since they already include items on insurance and alcohol consumption limits.

In addition, it is recommended that the DMV work with the California Bicycle Advisory Committee staffed by Rick Blunden (Chief, Office of Bicycle Facilities, Caltrans, Division of Highways), to revise the *Driver's Manual* to include more information for motorists regarding bicycles on the roadway—what to expect and how to respect their travel space.

Finally, it is recommended that the San Francisco Board of Supervisors request that the DMV review and revise as appropriate their written questions developed by the League of American Bicyclists, for the driver's exam relating to bicycle issues. Sample test questions developed by the League of American Bicyclists are contained in Appendix H.

Public Utility Company - A partnership between San Francisco and Pacific Gas & Electric (PG&E) would provide an ideal mass audience, since most households in the City have an account with PG&E.

A mailer add-in that promotes safe road sharing practices could be sent out annually to San Francisco residents.

Gasoline/Oil Company - A partnership with a gasoline/oil company would provide an excellent opportunity to reach motorists in San Francisco who patronize these companies. Since a good portion of motorists have charge accounts, including a brochure in their monthly billing once annually would help spread the message of safe road sharing practices.

As with the DMV, this mailer add-in would only be directed at San Francisco addresses.

Chevron, being one of the largest employers in San Francisco, would be an ideal candidate for this promotion. The company is very community minded and it already promotes safety in its industry, so promoting safety for its customers would be something that would be of interest to them.

Media Campaign/Public Service Announcements (PSAs) - The PSA component will be a key element in the success of the Motorist/Cyclist Program. The PSAs should simultaneously be broadcasted on television or radio. The message should be "safe road sharing" and it will reach a mass audience with support from the mailer portion of the campaign.

In conjunction with the San Francisco Bicycle Safety Week proposed in the "awareness/outreach events" portion of the plan, we suggest the PSAs be broadcast the week before and during the Bicycle Safety Week.

The PSA program should build upon the relationship initiated with the media sponsor of the Children's Program. That television or radio station would be the most likely partner interested in continuing to educate the public in bicycle safety.

The PSAs will be written and provided to the station ensuring that the main message is put across. The television or radio station will be approached to designate one of their on-air talent personnel to serve as the spokesperson in the PSA. In the case that an on-air media person is not available, a local celebrity, an actor, politician or athlete, could be used to deliver the message of safe road sharing.

Topics which could be covered in the PSAs include:

- ▶ Respect the bicyclists' right to the road
- ▶ Open car doors with caution to avoid "dooring" accidents
- ▶ Motorists need to use their right turn signal to avoid accidents with bicyclists
- ▶ Don't double park in bicycle lanes

Awareness/Outreach Events - Another way to promote the Motorist/Cyclist Program will be the proclamation of "Bicycle Safety Week" by the Mayor of San Francisco. This week of safety programs will be an excellent way for the proponents of bicycle safety to receive media coverage throughout the region.

"Bicycle Safety Week" will be a series of events leading up to the AYH Great San Francisco Adventure, an annual bicycle fun ride which is held on the second Sunday of June.

A "Bicycle Safety Week" banner will be used at the events throughout the week to help promote bicycle safety and roadsharing.

The week of activities would include:

- **Mayor's Press Conference** - A press conference held by the Mayor where he/she proclaims the week as a "San Francisco Bicycle Safety Week" will be an excellent opportunity to discuss the Motorist/Cyclist Plan with the media, and in turn, the public. This event will take place early in the week. As part of the activities, a bicycle safety demonstration will be presented.

- **Bicycle Safety Demonstrations** - Throughout the week, members of the SFBAC and SFBC could present bicycle safety demonstrations during lunch hours. These could either take place at specific companies, schools or at public places throughout the City like Justin Herman Plaza. These demonstrations would allow the general public to learn some basic bicycle safety tips quickly and easily.
- **Employer Outreach Event** - As a component of the Employer Outreach Campaign discussed in Chapter 10, a bicycle ride for the ten participating companies through the Financial District will be created as part of "San Francisco Bicycle Safety Week."

This comprehensive outreach program stresses bicycle safety to the employees while promoting bicycles as a viable transportation solution. This Bicycle Safety Week event will bring both of these components together in an actual riding atmosphere for the participants.

- **Children's Program Bicycle Rodeo** - The highlight of "San Francisco Bicycle Safety Week" would be the Bicycle Rodeo part of the Children's Program. As stated in the plan, the citywide rodeo will take place on Saturday.

With the help of the media sponsor of the Children's Program, this bicycle rodeo will again send the message of bicycle safety and roadsharing to the general public through the media.

- **AYH Great San Francisco Adventure** - "Bicycle Safety Week" has been planned to coincide with this well-attended event. The American Youth Hostel Great San Francisco Adventure is a bicycle fun ride that goes through the streets of San Francisco on the second Sunday of June.

This event is an excellent opportunity to distribute bicycle safety and roadsharing pamphlets. Information will be distributed by a staff member prior to the ride.

Other Outreach Opportunities

- **Critical Mass Ride** - As an option, consider distribution at Critical Mass, a gathering of bicycle enthusiasts who gather at Justin Herman Plaza, across from the Ferry Building, at 5:30 PM on the last non-holiday Friday of each month. Up to a 1,000 bicyclists ride up Market Street and end at different spots throughout the area, including Mission Dolores Park, Ocean Beach, the Marin Headlands or Candlestick Park.

This event is an excellent opportunity to distribute bicycle safety and roadsharing pamphlets. Information will be distributed by a staff member prior to the ride.

- **Le Tour de San France-isco** - As another option, we suggest a staff member distribute bicycle safety and roadsharing pamphlets at this yearly fun ride. City Sports Magazine sponsored this ride in the past, but it's under new sponsorship.

The Motorist/Cyclist Program is a broad plan that uses varying tools to reach mass audiences in an effort to promote the safe sharing of the roadways between motorists and cyclists. The different tactics implemented in this plan address the need to educate both bicyclists and automobile drivers so that bicycles and cars can co-exist safely on San Francisco's streets.

**Bicycle Safety Education Plan
Motorists/Cyclists Program
Estimated Program Budget**

- **Brochure**
 - ▶ Develop, design, write, coordinate production/printing of 500,000 brochures
- **Partner Recruitment**
 - Solicit partnership with companies (DMV, PG&E, oil company) for distribution of brochure
- **Media Coordination/PSAs**
 - Recruit media partner, coordinate and develop promotional message for PSAs
- **Mayor's Office**
 - Contact to propose and arrange for official designation for Bicycle Safety Week and the Mayor's participation in a press conference
- **Event Development**
 - Coordinate for Bicycle Safety Week, including:
 - ▶ Mayor's press conference
 - ▶ Three safety demonstrations presented by the Bicycle Safety Coalition;
 - ▶ Banner, and information distribution during AYH Great San Francisco Bike Adventure; and
 - ▶ Le Tour de San France-isco.

Total Labor: \$19,450.00⁽⁵⁾

- **Collateral**
 - Photocopying for 500,000 brochures
(black on colored paper): 14,782.04
 - Banner: 850.00
 - **Miscellaneous Expenses**
 - Deliveries, copies, fax, telephone, postage,
authorized local travel 1,000.00
 - ODC costs @ \$17.65: 2,935.56
- Program Total:** \$39,495.76

⁽⁵⁾ This figure represents labor for two account executives at public agency rates, \$100 and \$75, respectively, for approximately 200 hours of work.

ENFORCEMENT ISSUES AND RECOMMENDATIONS

This section presents recommendations for increased enforcement efforts in San Francisco. The goal of enforcement efforts is to increase public safety. When the public is knowledgeable about the rules and perceives that they are being consistently applied, compliance increases. Since public safety is at the heart of the reason for enforcement, the targets of enforcement should be primarily motorists and secondary bicyclists.

Enforcement should be composed of several strategies: citations, traffic school, fix-it tickets, verbal warnings, note to parents (for juveniles), as well as positive reinforcement techniques such as rewards for proper or exemplary behavior.

Public Relations - Media Awareness

Before any of the following measures are adopted, the public should be informed as much in advance as possible. Strategies for publicizing the new programs and enforcement targets were discussed under motorist-education programs and include press releases, neighborhood and city-wide newspapers, radio spots, water bill stuffers, local cable TV, schools, civic groups, etc. The mayor's office's contacts with the media should be used to maximum potential to get news of any new programs out to the public. For example, the recommended "Bicycle Safety Week" would be an appropriate follow-up to a media blitz on dangerous bicycling, pedestrian and motorist behaviors and the upcoming "crackdown" on violators.

The intent of an enforcement program is not to increase the number of citations issued but to achieve voluntary compliance with the laws and thus to reduce the number of bike accidents. In order for the enforcement program to work most effectively, it must be two-pronged. Motorists in particular should be targeted, as their vehicles are the most deadly. Violations by bicyclists are often the cause of serious accidents, particularly when speed is combined with non-compliance at traffic control devices. (Needless to say, the steep grades in San Francisco contribute to bicyclists being able to attain high speeds.) Therefore, bicycle safety education about appropriate riding techniques and the reasons why they are safe should be given priority over increased enforcement against bicyclists.

Specific Enforcement Strategies

Citations - The most commonly thought of enforcement strategy is issuing tickets to violators of the Vehicle Code or Traffic Code. The SFPD issued 630 tickets to bicyclists in 1991-1993. It is unknown how many citations were issued to motorists for failing to yield the right-of-way to a bicyclist or otherwise causing or almost causing a bicycle accident. Indeed, a review of the most severe car-bike crashes—those that resulted in a fatality—revealed that often, even when the motorist was deemed at fault, the motorist did not receive a citation.

In a city with many other serious enforcement priorities, however, there may not be the sense that bicycling violations are important, or that motorist violations are a significant problem. A recent article in *Bicycle USA*⁽⁶⁾ discusses the reasons for an enforcement program for bicyclists. The fact

⁽⁶⁾ The Law's For All, *Bicycle USA*, magazine of the League of American Bicyclists, September/October 1994.

that motorists are responsible for 40 percent of San Francisco's bike accidents and 80 percent of bike fatalities is reason enough to increase enforcement against motorists who violate bicycle rights and execute other unsafe maneuvers that threaten all San Franciscans, such as speeding, running red lights, etc.

Based on our analysis of San Francisco's accident data presented in Chapter 2, the four behaviors of bicyclists and motorists that are most likely to result in a car-bike crash were identified. The four behaviors by motorists that cause bike crashes are:

1. Opening car doors when unsafe into the path of a bicyclist. (This is the single most common cause of bike crashes in San Francisco);
2. Failure to stop at traffic control devices;
3. Failure to yield when turning left;
4. Unsafe turns (presumably right-turns, since there is no specific code for unsafe right-turns as there is for turning left).

The four behaviors that are responsible for about half of the cyclists-at-fault bike accidents are:

1. Passing on the right
2. Failure to yield
3. Wrong-way riding
4. Failure to stop at STOP signs and traffic signals.

In addition, driving under the influence of alcohol or drugs is a major factor in car-bike crashes for both the motorist and the cyclist.

These behaviors should be the emphasis of increased enforcement programs.

While running red lights and STOP signs is one of the causes of bicyclist at fault accidents, it must be recognized that many experienced bicyclists jump red lights for what they perceive to be safety reasons. By getting ahead of the traffic, they are able to merge across the travel lanes to turn left, they are able to stay out of the way of buses who constantly pull over to the right to unload and pick up passengers, and last but not least they are able to establish their place in the lane, which is important when travel lanes are not wide enough to share comfortably. Providing adequate width for bicyclists and buses to safely share the road will reduce the need for bikes to jump red lights. Providing bicycle priority streets will eliminate unnecessary STOP signs, and the temptation to run them as well.

While a bicycle passing a line of slowly moving or stopped cars is generally safe (and it must be admitted, one of the few joys of city cycling), passing on the right in other circumstances is a hazardous movement. In issuing citations, police officers must be able to distinguish between a bicyclist legitimately passing slow cars (either in a striped or defacto lane) and that of a bike passing on the right when he/she should pass on the left. These latter situations include: passing a stopped bus, passing a double-parked vehicle, and passing a right-turning vehicle. Bicyclists should also be educated regarding the dangers these maneuvers.

Traffic School - Once a bicyclist or motorist has received a citation, it should be viewed by the City as an opportunity to educate him/her. Traffic school curriculum should be developed that focuses primarily on bicycle issues from both the bicyclist's and the motorist's perspectives. As an alternative to the fine, violators should be given the option of enrolling in such a traffic school. It may be helpful to combine both bicyclists and motorists in the same class so a dialogue can ensue and they can learn from each other. (A balance between bicyclists and motorists should be maintained within each individual class.) Any motorist attending traffic school for any reason should be able to opt for the traffic school focusing on bicycle/motorist issues. (Why wait until they've committed a violation to educate them?) Motorists cited for bike infractions opting for traffic school would be required to enroll in the bicycle-issue oriented school if they opt for traffic school. Traffic school for bicycle offenders and motorist offenders would not go on their record. As with other traffic schools, they would be self-supporting.

Traffic school for juvenile violators should have a different curriculum than adult traffic school. Traffic school for juveniles could feature speakers with different perspectives: proper riding behavior from a police officer, consequences of unsafe riding from health care providers, serious injury survivors, paramedics, etc.

The City of Palo Alto's Fire Department operates a program for juvenile offenders wherein juveniles who receive a citation can attend traffic school in lieu of paying a fine or making a court appearance.

The Walnut Creek Police Department has a citation program for juvenile violators that does not use the court system. The program's effectiveness depends upon cooperation from the parents, its operating costs are negligible. Appendix H contains a sample letter and safety information that is sent to parents.

Modesto has a program for child offenders in addition to classroom education on bicycle safety. Enrollees are referred by the juvenile court and are required to bring their parent to a 1 to 1-1/2 hour session led by a police officer. The officer's salary represents the only cost to the city, and no program participants have repeated the program. The classes are held on a weekday evening, with enrollment averaging 1 - 15 students.

UC Davis has a traffic school program for university students who receive bicycle-related citations. The fees to attend traffic school stay within the UC Davis transportation program to fund the traffic school program and do not go to Yolo County as citation bails do.

Parental Notification Programs - A less onerous method of enforcing traffic and bicycle laws against juveniles would be a parental notification program. Under this strategy, the juvenile is not cited, nor must he attend traffic school, but a written notification of the violation is sent home to the juvenile's parents.

Fix-It Tickets - This program is essentially the same as the existing policy of writing a fix-it ticket when a vehicle is not equipped with the proper safety equipment or is not operating properly. The target of this enforcement should be reflectors, lights at night, helmets on children, and properly operating bicycles.

Positive Reinforcement - One way to foster good feelings between the police and the bicycle community is for the police to issue good behavior awards to bicyclists. Such positive reinforcement

techniques are particularly effective with children. Donations can be solicited for awards such as fast food vouchers, movie tickets, ice cream, etc. Bigger items, such as trips to Disneyland, electronics, etc. can be included in the program as raffle prizes that all awardees are eligible for. This program could be spearheaded by the Police Department itself or by a group of concerned parent volunteers. The latter is more likely given existing budget constraints.

Other Enforcement Issues

Bicycle-Mounted Police Patrols - Many cities now have bicycle mounted police patrols, so many in fact that there is a professional organization called International Police Mountain Bike Association (IPMBA).

Bicycles are used by almost every police station in San Francisco and the level of use is determined on a station-to-station basis by the police captains. Currently there are approximately 40 bicycles owned by police stations in the City and they are used primarily by officers who have been assigned a neighborhood beat. Their use is largely up to the individual officers, as there is currently no policy regarding when or how often they should be used. Obviously, when the weather is good, officers are more likely to use the bicycles that are available. Currently, the police department is attempting to standardize the uniforms to be worn by officers using bicycles in the City.

Bicycle-mounted police officers are more sensitive to bicycle rights and bicycle safety issues. In fact, there may be a case for placing all responsibility for increased bicycle enforcement solely in the hands of the bicycle-mounted officers.

Whether the police bike patrols are used primarily for bicycle/pedestrian enforcement, downtown beats or for community policing, the consensus has been that they are as effective (and in some cases more effective) as patrol cars in the course of an officer's normal duties and they are good public relations for the police department. While patrol car beats and patrol car back-ups will always be required, the SFPD should evaluate the potential of expanding mountain bike patrols into more neighborhoods as well as into park and downtown settings.

The Bay Area Rapid Transit District has a bicycle patrol unit in their police division. The program has been very successful in areas such as Civic Center/United Nations Plaza. In addition, the BART Bicycle Police unit is involved in promoting bicycle units in municipal police departments.

Reduction in Bail for Bicyclists - AB669, passed in 1994, allows cities the discretion to reduce fines for infractions of the vehicle code incurred by bicyclists. The assumption behind the legislation was that some police departments are hesitant to enforce certain bicycle violations, particularly when no threat to public safety is involved, due to the extreme fines involved: between \$50 and \$200, and are typically \$104. The intent of the legislation was to allow local jurisdictions to lower fines as they deemed appropriate in order to increase the number of citations issued. This will result in greater public awareness that certain behaviors are indeed risky and therefore illegal. The City of Davis requested this legislation and followed through by reducing fines to \$27 from \$54. All fines in Yolo County are consistent with the City of Davis. This authority that is being relinquished to local authorities should be embraced by the City of San Francisco, and it is recommended that fines for most bicyclist infractions be reduced to \$25.00.

Training for Police Officers - Training for officers can take place through existing channels such as inter-office memos and correspondence, and also through peer education using the bicycle-mounted officers. Support from higher up in the administration will be essential if an increased enforcement program is to succeed. In addition, a video such as *The Law is For All* could be shown to all officers. This video, produced by Blue Sky Productions in Lansing Michigan,⁽⁷⁾ aims to sensitize police officers that enforcing bicycle laws should be part of their priorities as a public safety issue. Any video should be reviewed and approved by the BAC.

Additional training for police officers should occur to encourage them to include as much information on the police accident reports as possible for two reasons. The first is to be able to fully evaluate the cause of the crash. Reports should include information such as whether the motorist signaled a turn, whether the motorist or the bicyclist had the right-of-way, etcetera. The second would be from a public health viewpoint, and would help to determine whether lack of safety equipment, such as helmet and lights, contributed to the severity of the injury.

Innovations of Other Cities - The City of Seattle, well-known for its multi-pronged approach to being bicycle friendly, has two policies that ensure that violations are enforced. The first is a policy which requires each officer to issue one citation daily to motorists who fail to yield the right-of-way to pedestrians, and to issue tickets for jaywalking every other day. The second is a procedure by which a "plant" is used, either a pedestrian or bicyclist, at a particular location which a police officer can monitor. Conflicts are intentionally created with the knowledge and consent of the police and the violators are subsequently cited.⁽⁸⁾

Summary of Enforcement Recommendations

1. Begin the Enforcement Program with a media blitz including the designation of Bicycle and Pedestrian Safety Week.
2. Target the four behaviors of motorists and bicyclists most likely to result in accidents for increased enforcement in addition to:
 - i. Enforcing motor vehicle speed limits on all city streets.
 - ii. Enforcing parking and double parking violations, particularly in bike lanes and on established bike routes.
3. Encourage police officers to contribute articles to neighborhood newspapers and bicycling publications to present their perspective and foster communication between the two groups. For example, Officer Lois Perillo, who patrols on a bicycle, focussed on bicycling issues in one of her POLICEBEAT columns for the Noe Valley Voice.

⁽⁷⁾ Made possible by the League of Michigan Bicyclists and League of American Bicyclists. The video costs \$14.95 plus \$3.25 for shipping and handling, and can be ordered by calling 1-800-288-BIKE. (See Appendix H.)

⁽⁸⁾ Federal Highway Administration, National Bicycling and Walking Study Case Study No. 13, *A Synthesis of Existing Bicyclist and Pedestrian Related Laws and Enforcement Programs*, March 23, 1993.

4. Support the Bike Patrol officers' membership in the International Police Mountain Bike Association (IPMBA), including its training sessions and conferences.
 - i. Consider expansion of the police mountain bike patrols.
5. Establish Traffic school for motorist and bicycle violators of bicycle -related laws.
6. Consider positive behavior reinforcement program to reward good bicycling and pedestrian behavior.
7. Establish training program for officers.
8. Reduce the bail for bicyclist infractions from \$55 - \$200, to \$25.00.



10. BICYCLE PROMOTION PROGRAMS

REVIEW OF PROMOTION PROGRAMS

In the present climate of mandated reductions in automobile use, a variety of Transportation Demand Management (TDM) programs have been implemented by state and local governments and private industry. These programs have focussed on education, information and incentives to get people to stop driving alone to work. Carpools, vanpools, and transit are the most popular alternative modes. Bicycle commuting is often an overlooked or underutilized opportunity for attaining these trip reduction goals.

For this section, we have researched existing bicycle commuting encouragement programs in the Bay Area and around the country sponsored by both government agencies and private industry. Responses to our investigation have turned up a wide variety of programs and, to our pleasant surprise, much interest by those surveyed in the results of our study. We also found that, in many instances, the development of bike commute promotion programs is being limited by company concerns for employee safety and employer liability. Many companies feel that bicycle access to their facilities is severely compromised by barriers and dangerous traffic conditions. They, in good conscience, do not feel that they can promote such a dangerous activity as bicycle commuting. Also, they are concerned about their liability if an employee was seriously hurt or killed while participating in a company promoted activity such as bicycle commuting. Whether or not these are legitimate concerns, they were expressed by commute coordinators at several companies and has resulted in company policy of not actively promoting the bicycle as a commute alternative.

The success rate of these promotion programs was difficult to assess in numeric terms of how effective they have been in encouraging new bike commuters. Unfortunately, information on the number of bicycle commuters before and after implementation of the program is not available. Therefore, commute coordinators were asked to estimate the current number of bike commuters as a percentage of the employee base and to evaluate their promotion programs on the basis of demand for the services, i.e. how many bicycle lockers are checked out, how full are bicycle parking rooms, how many participants in incentive programs. The complete database from our research is included in Appendix I.

A bike commute promotion program can be implemented by a city, company, university or other organization. The specifics of each program will differ based on the potential audience, but we have found that an effective bicycle commuting promotion program must include the following:

- ▶ The TDM program must identify bicycle commuting as an option;
- ▶ The TDM program must provide an incentive to use bicycle commuting; and
- ▶ The TDM program must support and applaud bicycle commuting.

Identify Bicycle Commuting as an Option

Before the bicycle can be considered as an alternative mode of transportation, the availability, feasibility and benefits of bicycle commuting must be known. Many people are unaware of the opportunities that bicycle commuting can provide. An extensive advertising campaign must be developed to get the message out. The actual components of this campaign will depend upon what group is being targeted, i.e., employers, city officials, city employees, students, and/or the general population. A campaign will be most successful if it is tailored to a specific group and can address the questions and doubts of that group.

This campaign should include information about monetary, environmental and health benefits of bicycle commuting. It should also address and attempt to dispel many of the perceived obstacles to bike commuting. Many of the TDM programs currently in effect use newsletters, special events, and workshops to educate potential bicycle commuters. Information should be included on what kind of bicycle and other equipment is needed, where the safe and secure bicycle parking is located, where bike shops are located, and the available transit-access options. Bicycle route maps, safety information, effective-cycling pamphlets and flyers of upcoming bicycle events can be distributed in employee paycheck envelopes or mailed with utility bills to reach the population of a city, county or region.

Some of the existing programs go even further and provide a bicyclist information network. These networks can be used by the potential bicycle commuter to learn what the best commute routes are for their personal needs, to locate experienced bicycle commuters in their area who are willing to advise and escort them during their first bicycle commutes, and to find out what events and activities are coming up.

Provide an Incentive to Use Bicycle Commuting

Many of the existing TDM programs use monetary or other incentives to lure the prospective participant out of their single-occupant-vehicle (SOV) and into a carpool or transit. Many TDM programs include similar incentives for bicycle commuting, but these can often be expanded using the existing transit and carpool incentives as a guideline. The most effective incentives for bicycle commuting currently being used are:

Bicycle Infrastructure - Good bicycle routes providing access to the locations frequented by the bicycle commuter are critical to an encouragement program. Bicycle route maps and an identifiable route signage system are necessary to support the route network. Obviously, developing a bicycle route network to serve its employees is beyond the ability of the company to provide but is rather the responsibility of the local city and/or county jurisdiction. However, a company can lobby the local agencies for improvements to bicycle access for its employees or institute an "Adopt-a-Lane" program to construct, maintain or beautify bicycle facilities in the area. Interest and support by the business community in the bicycle as transportation will serve to increase the interest and support of local governments and potential bike commuters.

Parking - The provision of secure, protected, convenient and inexpensive bicycle parking is crucial to the success of bicycle commuting promotion.⁽¹⁾ Suitable bicycle parking can be provided with bicycle lockers, bicycle storage rooms, locked cages, and attendant parking. Allowing bicycles into the workplace is the least costly for the employer to provide. However, space is not always available in the workplace for the parking of bicycles and often bicycles are not allowed into the building itself. It may be necessary for the employer and employees to work with building owners/operators to negotiate for permission bring bicycles inside or for a suitable bicycle storage room.

Cash Incentives - Several varieties of a cash incentive to the employee to encourage the bike commute were found in this research. As part of many TDM programs, a subsidy is given to employees who use transit or other alternative commute modes. Several companies have also made this cash dividend available to bicycle commuters for each day that they commute by bicycle.⁽²⁾ Discounts or credits at bicycle stores and/or company stores and cafeterias is another means for providing an incentive to employees for bicycle commuting.⁽³⁾ The City of Palo Alto reimburses its employees \$0.07/mile for authorized city business travel made on a bicycle.

Other programs have been developed aimed at recruiting new bicycle commuters. In some of these programs, companies provide company bikes for a trial commute by the employee. Other companies assist the employee in the purchase of a bicycle. This latter program has taken many forms, including reimbursing the employee for the purchase after commuting for a period of time, providing financing for a new bike, or offering an easy payroll deduction plan.⁽⁴⁾ Other possible encouragements might include paying employees for their bicycle commute time in excess of the time spent in the auto commute or giving bicycle commuters 15 minutes of additional vacation time for each day that they bike commute.

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- (1) At Hewlett-Packard in Silicon Valley, over 140 bicycle lockers have been in high demand since they were installed; there is currently a waiting list for their use. At Adobe Systems in Mountain View, bicycle parking is available in certain stairwell areas. Parking is controlled by a formal posted policy approved by Adobe's Facilities and Security Departments and the city's fire department. These parking areas are kept organized with bicycle floor stands like those used for bike display in bike shops. Sun Microsystems, Palo Alto, and Walker, Richer & Quin, Inc. of Seattle both have secure bike storage rooms with card-key access.
- (2) At Alza Corporation (Palo Alto), City of Menlo Park, and Apple Computer, employees are reimbursed \$1/day for each day they bike commute. At Honeywell Satellite System Operations in Glendale, AZ, bike commuters are paid \$0.25/day for their bike commute.
- (3) Stanford University provides a yearly \$70 voucher to any employee who does not buy a yearly parking permit good for bike services at the campus bike shop or for daily parking fees. The City of Palo Alto distributes monthly \$20 vouchers for three local bike shops to any commuter who bikes 60% of the time. Fleetwood Enterprises in Riverside gives its regular bike commuters a safety package including helmet, reflective vest, and headlamp. The University of California at Davis gives regular bike commuters discount bus coupons for non-pedal days. NIKE in Beaverton, Oregon, gives employees a \$1 credit at company store and cafeteria for each bike commute day.
- (4) Taligent, Inc (Cupertino), City of Palo Alto, and Fleetwood Enterprises (Riverside) offer company-owned bikes for trial bike commutes. Fleetwood Enterprises and Rockwell International (Southern California) go even further by subsidizing the purchase of a new bike and helmet.

A parking cash-out program⁽⁵⁾ is another opportunity to provide a cash incentive to employees while perhaps reducing costs to the employers. Under this program, the employee is able to "cash-out" their parking privileges and receive the cash-equivalent or transit pass equivalent of the parking spot. Employers who lease parking spaces for their employees can reduce the number of spaces they require and pass this savings on to their employees while promoting commute alternatives.

Convenience Incentives - One of the primary obstacles to transit and bicycle commuting is the perceived inconvenience factor. TDM programs have addressed this concern with the Guaranteed Ride Home. In the event of sickness, family emergency, or even inclement weather, the bicycle commuter is provided with a taxi voucher or other means for a ride home. This is a small price to pay for the peace of mind of the employee and the increase in number of bicycle commuters. Fleet bicycles are provided by many cities and companies for the use of the employee during business hours. Shuttles between company facilities have also been improved to include bike racks. Fleet bikes are often also available for the employee to use for their commute on a trial basis as discussed above.

Other convenience incentives which have been popular in existing TDM programs are on-site bicycle repair kits for flat tire and broken chain emergencies, on-call repair services with a local bicycle shop, flex hours so the employee can avoid rush hour or darkness, showers and locker rooms for clean-up and changing after the commute, closet space for storage of clean clothes and relaxed dress codes for bicycle commuters.

Support and Applaud Bicycle Commuting

Endorsement of bicycle commuting by those in charge is a significant aspect of a promotion program. Prospective bicycle commuters are more apt to try out this unconventional mode if it is acceptable to the supervisors, elected officials and peers. Organized and advertised rides such as "Ride with the CEO" or "Ride with the Mayor" clearly demonstrate their support and enthusiasm. At one of the most successful state rides, *Cycle Oregon*, the Governor of Oregon gave the opening statement and then rode along with participants for a portion of the first day. Advertising campaigns aimed at informing commuters on the merits of bicycling should include endorsements by key officials as well as interviews with peers who currently commute by bicycle. Programs by a city or company to promote bicycle commuting should be as comprehensive as the programs established to encourage transit use. If cash subsidies are offered for transit use but not for bicycling, the message that bicycles are not as acceptable as transit is clearly being given.

Implementation of the programs discussed above will do a great deal towards encouraging bicycle commuting. Other activities which could be used to generate interest are monthly prize drawings for participants in the bicycle commute program. A *Bike-to-Work* day should be organized in conjunction with the annual national event in May. But one day a year is not enough. Bike days should be held on a regular basis, perhaps once a month. Competitions between departments or companies could be set up. A bicycle commute coordinator is essential to provide the information

⁽⁵⁾ We were not able to find a parking cash-out program currently being used. Stanford University is evaluating the possibility of a cash-out program in the future.

and encouragement for prospective bicycle commuters. Also, bicycle buddy programs to match new commuters with experienced commuters are helpful.

REVIEW OF EXISTING SAN FRANCISCO BICYCLE EVENTS

During the year there are many sporting and other theme events held in San Francisco. These events can attract a lot of regional and even national attention and offer the City and other organizations an opportunity to reach many people while providing a good time. To make the most of the promotion potential of these events, it is preferable to first determine who is the audience and what message is intended to be conveyed. For example, is it to reach bicycle commuters, bicyclists who do not bicycle commute, or non-bicyclists? Is it to educate and inform the audience about how to share the road, bicycling safety or the advantages of bicycle commuting?

Perhaps the most well known and well attended bicycle events in San Francisco are the Macy's/AYH *Great San Francisco Bike Adventure*, the *Tour de San France-isco*, and the *AIDS Bike-A-Thon*. These events are charity fund raisers and attract bicyclists of all ages and abilities. Promotion efforts could be directed towards safety education and the advantages of bicycle commuting. Event directors could use the opportunity to teach participants the rules of bicycling courtesy.

Another well publicized bicycle event is *Critical Mass*, which is held on the last Friday of the month. *Critical Mass* seeks to increase the public's awareness of the bicycle as a legitimate transportation mode and to demonstrate how safe bicycling can be when bicycles comprise the majority of the traffic.

There are several other bicycle events held in or passing through San Francisco. Among these are *Giro di San Francisco*, *Go Greenbelt* (a 7-day around-the-Bay tour), *California North Tour* (a 4-day tour from Sacramento to San Francisco), and *Silent Night Bike Ride*. Although these events are not as well known as those discussed previously, they do provide an opportunity for distributing safety and bicycle commuting promotional materials.

Another opportunity for bicycle commuting promotion and education are those events which are directed at changing our commute habits. *Bike-to-Work Day*, *Beat-the-Backup*, and *Earth Day* are existing events which could be expanded to encourage more participation. Instead of having only an annual *Bike-to-Work Day*, it might be preferable to have *Bike-to-Work Week* or a monthly *Bike-to-Work Day*.

Other events in San Francisco such as street fairs, *Festival d'Italia*, *Cherry Blossom Festival*, and July 4th fireworks should provide good bicycle access with free secure bicycle parking. As part of the event advertising, the best bicycle route to the event should be published along with the location of the bicycle parking.

RECOMMENDED PILOT EMPLOYER OUTREACH CAMPAIGN

San Francisco is one of the biggest business centers in the world, with a densely compacted central core, heavy automobile traffic patterns and extreme parking deficiencies. Business employees who commute to their jobs in the City via automobiles and other forms of transportation are confronted daily with traffic jams, costly parking fees and an inadequate number of parking spaces.

Bicycling is an ideal commute alternative in San Francisco, a city seven miles wide with 80.4 percent of the residents also working in the City. Unfortunately, only one percent of the employees in San Francisco chose a bicycle as their form of transportation in 1993.⁽⁶⁾ This percentage ranked only sixth among the eight counties in the Bay Area Region. Only Solano and Contra Costa Counties had fewer citizens using bicycles to commute at 0.8 and 0.3 percent, respectively.

The following Outreach Campaign is designed as a pilot program for use by the City to educate and assist San Francisco companies in promoting bicycling as a viable commute alternative. The campaign would be conducted by the City's Employee Commute Coordinator with assistance from the Bicycle Coordinator. Means of funding for this and other recommended programs is discussed in Chapter 4.

Objective

The objective of the Pilot Employer Outreach Campaign is to introduce bicycle commuting to San Francisco businesses and provide them with the tools to promote the bike-commute among their employees. The most imperative element to the success of this program is to have the support of key City officials, i.e. the Mayor and Board of Supervisors. The attitude of the City needs to clearly demonstrate its enthusiasm and support of bicycle commuting. Every City department must get the green light directly from Mayor Jordan to prioritize bicycle commuting as a viable solution to the City's traffic and parking problems. A commitment from the City to improve safety conditions (i.e: bike routes, traffic obstacles, prosecution of motor vehicle violation in biking accidents) and provide secure parking is crucial to this endorsement. It is also important that the public see the City and City employees take the lead in demonstrating the positive aspects of bicycle commuting by doing it themselves. How can the City of San Francisco expect the business community to encourage bicycle commuting if they have not already done so.

With this campaign in its formative stages, the pilot program is targeted at 10 of San Francisco's largest employers with the City also participating and serving as a role model. The program is directed at the companies' Transportation Demand Management (TDM) programs. Companies with over 100 employees are mandated by law to have a TDM program to promote alternative modes of transportation. The Pilot Employer Outreach Campaign will strongly encourage and support inclusion of bicycling as one of the commute alternatives that these companies can offer their employees.

⁽⁶⁾ RIDES for Bay Area Commuters, *Commute Profile '94 for the Route 85 Project*, 1994, p.1.

Guidelines for Corporate Selection

In order for the Pilot Employer Outreach Campaign to have maximum impact on the bicycle commuting patterns of San Francisco's companies and their employees, the 10 companies selected must be receptive to bicycling as an alternative. To identify and select the companies for the pilot campaign, we recommend a survey of San Francisco's 25 largest corporations to determine which employers are best positioned and will be most receptive to the Pilot Employer Outreach Campaign.

The main goal of this survey is to evaluate the strength of the TDM programs currently in place so that the 10 companies with the strongest commitment to finding alternative modes of transportation can be approached about participating in the Pilot Employer Outreach Campaign. Another portion of the survey would be addressed to the owner/operators of the buildings which house these corporations to determine their willingness to accommodate the special needs of bicycle commuters.

The survey should be accompanied with an introduction letter from Mayor Jordan encouraging cooperation in promoting bicycle commuting. This letter should also state the commitment on behalf of the City to improve safety and route conditions and provide sufficient, accessible and secure parking. The letter should be accompanied by a public awareness campaign through advertising and public relations.

This corporate survey will assess the following information:

Level of Activity/Strength of TDM Coordinator - The survey will reveal information on the strength and vitality of each company's TDM program. Employers that have only a very basic program or that have an under-aggressive TDM coordinator will be eliminated from participation in the Pilot Employer Outreach Campaign.

Participation by Employees - The survey will show the level of participation by company employees in using commute alternatives reflecting their potential receptivity to the program.

Types of Programs Offered for Employees - The survey will assess the types of programs each company currently provides for its employees. With this information, the Pilot Employer Outreach Campaign can be tailored to each company's specific needs.

Willingness to Use the Pilot Employer Outreach Campaign - The survey will probe a company's willingness to incorporate the Pilot Employer Outreach Campaign into its TDM curriculum. This is perhaps the most important aspect of this survey. A ranking of willingness will reveal the 10 companies that will be most receptive to the pilot program.

Potential Support of the Building Owner/Operators - This should be a part of the survey to allow the corporations and building owner/operators to be aware of each other's involvement in this process. The questions should determine the willingness of the building owner/operator to work with its corporate tenant to provide easy bike access to offices and/or designated secure parking.

The 10 companies that participate in the Pilot Employer Outreach Campaign will provide feedback needed to build the pilot program into a larger one in which more companies will promote bicycles as a viable commute alternative. As previously mentioned, the City of San Francisco will be participating in the Pilot Campaign as one of the 10 companies. It is important enough to repeat

that the City must take the lead in this program and through its example, encourage employers and employees to participate.

Tactical Recommendations

Participation of Key Decision Makers - To achieve the greatest response possible, it is imperative to reach key decision makers at each of the 10 companies designated to participate in the program and to solicit their participation in promoting bicycles as a commute option. The letter of introduction to the program from Mayor Jordan written and addressed on letterhead from the Mayor's Office will serve as evidence of the City's commitment to bicycle commuting in San Francisco.

- **Employee Transportation Coordinator (ETC) - The Key Contact** - The ETC at each company will be the key person in making the Pilot Employer Outreach Campaign a success, since they are the individuals designated at their companies to promote commute alternatives. After the 10 participating companies are selected, the Employee Commute Coordinator will hold a meeting with all of the ETCs to explain the Pilot Employer Outreach Campaign. The ETC will be able to implement company-wide mailings, on-site bicycle events and other tactical program elements into their company's general participation in the Bicycle Commuter Education Program.
- **Human Resource/Benefits Manager** - The human resource/benefits manager is the person who can make it easier to put on events and reach employees that will deliver the message that bicycles are a viable commute alternative. Since they are in many cases in charge of internal employee communication, they can work in cooperation with the ETC to promote the Pilot Employer Outreach Campaign.

The Employee Commute Coordinator will contact the human resource/benefits managers at the participating companies with a letter asking for their help in promoting the Pilot Employer Outreach Campaign throughout their organization.

- **Chief Executive Officer/President** - Involving the CEO or president will set the pace for the program and gain immediate attention company-wide. While the CEO/President won't be involved in the day-to-day operation of his/her company's TDM program, a company-wide letter from this person discussing the Pilot Employer Outreach Campaign will give the promotion a high-profile launch.⁽⁷⁾

Each company's ETC will be asked to approach their CEO/President about his/her participation in the Pilot Employer Outreach Campaign.

Employer Resource Kit - To provide the ETCs with the support they will need to launch their bicycle programs, an Employer Resource Kit that outlines the Pilot Employer Outreach Campaign will be developed.

⁽⁷⁾ See Employer Resource Kit, described below, for more details.

The Employer Resource Kit will include:

- **Letter from Mayor Jordan** - This would be specifically addressed to employees (different from letter to CEOs and building owners) pointing out the benefits of bicycle commuting while addressing the ways the city will be committed in supporting this alternative to commuting.
- **Letter from CEO/President** - Text for a letter from the CEO/President explaining the Pilot Employer Outreach Campaign and urging his/her employees to consider the bicycle when making commute choices will be developed. ETCs will use the text, fill-in the correct name, and distribute as the program kick-off.
- **Pre-Developed Articles** - Pre-written articles about bicycling as a great commute alternative will be prepared. These stories can be used in company newsletters, as all-staff memos, bulletin board fliers or any other outreach method in place at the company.
- **Ideas for Programs and Events** - A list of programs and events will be included for use in designing a plan that works best for each company. The list will provide details of existing events as well as programs that could be implemented at the company independently. City-sponsored event should be included in this list.
- **An Extensive Resource List** - A resource list detailing books, materials, resource centers, successful programs, bike shops and bike coalitions will be included. Since the ETC may not be versed in the benefits of the bicycle as a viable commute alternative and what resources are available to them, this list will be invaluable.
- **Route Maps** - To help promote bicycle commuting, route maps showing the best bike commute routes in the City will be included for distribution, posting and promotional uses. Many potential bike commuters could find the option more appealing with information about the fastest, safest and easiest routes to use.
- **Bicycle Safety and Roadsharing Brochures** - The brochures used for the Motorist/Cyclist Program (described in Chapter 9) will be included in the kit to promote safe bicycling and the safe sharing of roadways between motorists and cyclists.
- **Local Bicycle Store Listings** - Listings of local bicycle stores will enable employees to find the correct equipment so that they can ride to and from work safely.

Bicycle Safety Demonstrations and Bicycle Events - Special events to highlight the Pilot Employer Outreach Campaign will help gain attention to the program and provide an opportunity to educate about bike commuting. Events will motivate employees to consider bicycle commuting and put potential riders in touch with peers who commute by bike. Bicycle safety demonstrations held during lunch hour at each of the 10 participating companies will be a key element of the event

program, since demonstrations make concepts memorable. These demonstrations will be sponsored by the City as part of the Outreach Campaign.

Assistance by members of the San Francisco Bicycle Advisory Committee, the San Francisco Bicycle Coalition, "Effective Cycling" groups and bicycle safety organizations will be solicited in setting up this program. Funding for the demonstrations will be included as part of the Pilot Campaign or may be available through safety education funds as discussed in Chapter 4.

Participating companies will take part in the "San Francisco Bicycle Safety Week".⁽⁸⁾ During this week-long event, employees of the 10 participating companies will have the opportunity to join their peers in the "Financial District Ride" one evening during the week. This will not be promoted as another *Critical Mass* experience. This should be clear in the event's promotional materials and in soliciting participation and support. It will be differentiated by pointing out the following: it is set-up with clear safety guidelines, it is a pre-registered event and it is a supervised event .

This event is a perfect opportunity for employees who haven't been on a bicycle in years to rediscover the joy of riding with their colleagues. This is not a race to see who can cover the course the quickest, but an opportunity for the program's 10 participating companies to compete against each other to see who will have the highest percentage of riders on that day. The company with the highest percentage of participants will be awarded a trophy and each member of this team will receive a 10 percent discount coupon to a bicycle store. Each participant in the ride will receive a T-shirt.

A small entry fee (\$15-\$20) for each participant will help offset some of the t-shirt and trophy costs. Administrative costs, such as postage and entry processing, should be taken into consideration when setting the entry fee so that a portion of these costs can be covered. The Financial District Ride will be promoted through the ETCs at each company, who will pass out entry forms and returning the completed forms to event organizers.

The goal is for each company to have a fun, non work-related event for their employees to enjoy themselves while providing them with an enjoyable bicycle experience. As a result, some of the participants might consider bicycling as a viable commute alternative.

To maintain interest and attention on bike commuting after the "Bicycle Safety Week" is over, a monthly or quarterly City ride should be organized. These rides would be supervised and designed with clear safety guidelines and a pre-determined route.

On-Going/Expanding Programs - With the groundwork solidly in place to introduce San Francisco companies to bicycling as a viable commute alternative through this pilot program, steps will need to be taken in future years to enhance the Bicycle Commuter Education Program. The City, with the lead from the Mayor's Office should be the first to administer these further steps to encourage and promote bicycle commuting. With the following enhancement plans, this program has the opportunity to make a real difference in the commute choices of San Francisco residents:

⁽⁸⁾ Proposed in Technical Memorandum #9.

Program Expansion - In subsequent years, the program will be expanded to include more companies. With the addition of more employers to the Pilot Employer Outreach Campaign each year, the message that a bicycle is a valuable mode of transportation will become more widespread.

Worksite Improvements - Companies that currently don't have a suitable park-and-lock area for bicycles will be encouraged to identify and designate such an area. Employees will have a more positive feeling about riding their bicycles to work if they have a safe space to park.

Incentive Programs - Incentive programs have had success in other commute alternative programs, and the implementation of such a campaign could be the vital link to the overall growth of bicycle commuting in San Francisco. These programs, discussed in detail earlier in this chapter, provide a convenience or cash incentive to bike commute. They include:

- ▶ Cash dividend to bike commuters;
- ▶ Mileage reimbursement for company business travel by bike;
- ▶ Discount coupons or credit at bike stores, company stores and cafeterias;
- ▶ Bike purchase financing;
- ▶ Credit of work time or vacation time;
- ▶ Flexible work hours;
- ▶ Guaranteed ride home;
- ▶ Fleet bicycles for day-use or bike-commute try-out;
- ▶ Showers and clothing lockers;
- ▶ Relaxed dress codes; and
- ▶ Repair kits/on-call repair services.

The Pilot Employer Outreach Campaign is designed to provide San Francisco's companies with an easy-to-use bike commute promotion package to include in their TDM program. This program is designed to inform employees that bicycling is a viable commute alternative. With only one percent of the employees in San Francisco choosing a bicycle as their mode of transportation in 1993, there is a clear need to inform and promote this commute alternative within the workforce.



APPENDICES



Division of Traffic Engineering

ANK M. JORDAN, Mayor
 IN E. NEWLIN, Executive Director

Prepared by Dept. of Parking
 and Traffic
 April 4, 1994

*INTERSECTION TRAFFIC ACCIDENT
 Annual Report from January 1, - December 31, 1993*

<i>RANK #</i>	<i>INTERSECTION HIGH ACCIDENT LOCATIONS</i>	<i>TOTAL ACCIDENTS</i>	<i>#PED. ACC.</i>	<i>CHANGE FROM 1992</i>	<i>POSITION 1992</i>
1	4th Street & Harrison St.	29	0	+ 9	5
2	13th Street, Howard, South Van Ness	23	0	- 21	1
3	Market, Oak, South Van Ness, Van Ness	20	8	+ 8	24
4	3rd Street & Harrison St.	18	3	+ 6	24
5	Bay, Columbus, Jones	17	2	+ 8	61
6	3rd Street, Mendell, Palou	16	2	+ 10	N.L.
6	19th Avenue & Sloat Blvd.	16	1	+ 3	17
6	5th Street & Howard St.	16	3	+ 12	N.L.
6	7th Street & Mission St.	16	0	+ 11	N.L.
6	10th Street & Harrison St.	16	0	- 4	5
6	Army Street Circle	16	1	+ 8	42
12	12th St., Mission, Otis, South Van Ness	15	2	- 3	7
12	Geneva Ave. & San JOse Ave.	15	0	+ 8	N.L.
14	14th Street, Church, Market	14	3	+ 1	17
14	7th Street & Howard St.	14	1	+ 4	40
14	9th Street & Howard St.	14	2	+ 8	N.L.
14	Broadway & Van Ness Ave.	14	2	- 7	3

<u>RANK #</u>	<u>INTERSECTION HIGH ACCIDENT LOCATIONS</u>	<u>TOTAL ACCIDENTS</u>	<u>#PED. ACC.</u>	<u>CHANGE FROM 1992</u>	<u>POSITION 1992</u>
18	Gough, Haight, Market	13	0	- 3	8
18	5th Street & Folsom St.	13	1	+ 6	N.L.
18	Fulton St. & Masonic Ave.	13	0	+ 6	N.L.
21	13th street, Duboce, Mission, U.S.-101 Off-ramp, Otis	12	0	- 2	12
21	16th Street & Valencia St.	12	2	+ 5	N.L.
21	Duboce Ave. & Valencia St.	12	1	+ 2	40
21	Ellis St. & Van Ness Ave.	12	0	+ 6	N.L.
21	Geary Blvd. & Laguna St.	12	3	+ 9	N.L.
21	O'Farrell St. & Van Ness Ave.	12	2	+ 5	N.L.
21	Pine St. & Van Ness Ave.	12	2	+ 3	61
28	16th Street, Market, Noe	11	1	+ 5	N.L.
28	3rd Street & Folsom St.	11	0	0	31
28	5th Street & Harrison St.	11	0	- 3	12
28	8th Street & Folsom St.	11	2	+ 4	N.L.
28	Bay St. & Van Ness Ave.	11	1	- 2	17
28	Fell St. & Laguna St.	11	0	+ 6	N.L.
34	Plymouth, Sagamore, San Jose, Sickles	10	1	- 1	31
34	14th Street & South Van Ness	10	1	- 4	12
34	19th Avenue & Taraval St.	10	1	+ 1	61
34	25th Avenue & Clement St.	10	2	+ 7	N.L.
34	3rd Street & Howard St.	10	2	+ 6	N.L.
34	6th Street & Harrison St.	10	0	+ 4	N.L.

RANK #	INTERSECTION HIGH ACCIDENT LOCATIONS	TOTAL ACCIDENTS	#PED. ACC.	CHANGE FROM 1992	POSITION 1992
34	8th Street & Bryant St.	10	0	+ 4	N.L.
34	Army St. & Mission St.	10	2	- 3	17
42	Eucalyptus, Junipero Serra, Ocean	9	0	+ 1	87
42	7th Avenue & Balboa St.	9	0	+ 6	N.L.
42	19th Avenue & Junipero Serra	9	0	- 1	40
42	19th Avenue & Lincoln Way	9	2	+ 3	N.L.
42	2nd Street & Folsom St.	9	0	+ 4	N.L.
42	4th Street & Bryant St.	9	2	+ 6	N.L.
42	5th Street & Mission St.	9	4	+ 2	N.L.
42	8th Street & Harrison St.	9	0	- 5	12
42	9th Street & Folsom St.	9	0	0	61
42	10th Street & Mission St.	9	1	+ 6	N.L.
42	23rd Street & Potrero Ave.	9	2	- 3	24
42	24th Street & Mission St.	9	2	- 4	17
42	24th Street & Potrero Ave.	9	0	- 2	31
42	29th Street & Mission St.	9	2	+ 1	87
42	Army St. & Folsom St.	9	1	+ 1	87
42	California St. & Van Ness Ave.	9	1	+ 2	N.L.
42	Eddy St. & Leavenworth St.	9	4	+ 6	N.L.
42	Eddy St. & Van Ness Ave.	9	1	+ 2	N.L.
42	Leavenworth St. & Sutter St.	9	0	+ 9	N.L.
42	Oak St. & Scott St.	9	1	+ 7	N.L.
42	San Bruno Ave. & Silver Ave.	9	2	+ 4	N.L.

<u>RANK #</u>	<u>INTERSECTION HIGH ACCIDENT LOCATIONS</u>	<u>TOTAL ACCIDENTS</u>	<u>#PED. ACC.</u>	<u>CHANGE FROM 1992</u>	<u>POSITION 1992</u>
63	3rd St., Geary, Kearny, Market	8	4	- 2	40
63	6th St., Golden Gate, Market, Taylor	8	5	+ 3	N.L.
63	Columbus, Leavenworth, North Point	8	1	+ 6	N.L.
63	Guerrero, Hermann, Laguna, Market	8	0	+ 2	N.L.
63	Portola, Santa Clara, Vicente	8	1	+ 8	N.L.
63	19th Avenue & Noriega St.	8	2	+ 6	N.L.
63	25th Avenue & Geary Blvd.	8	4	- 1	61
63	2nd Street & Harrison St.	8	0	+ 4	N.L.
63	3rd Street & Bryant St.	8	2	+ 2	N.L.
63	3rd Street & Evans St.	8	1	+ 2	N.L.
63	3rd Street & Mission St.	8	2	+ 5	N.L.
63	4th Street & Brannan St.	8	2	+ 5	N.L.
63	6th Street & Bryant St.	8	0	- 14	2
63	7th Street & Harrison St,	8	2	+ 2	N.L.
63	10th Street & Howard St.	8	2	+ 2	N.L.
63	17th Street & Potrero Ave.	8	0	- 2	40
63	20th Street & South Van Ness	8	2	+ 6	N.L.
63	20th Street & Valencia St.	8	0	+ 3	N.L.
63	Alemaný Blvd. & Sickles Ave.	8	0	- 1	61
63	Arguello Blvd. & Fulton St.	8	1	+ 3	N.L.
63	Bayshore Blvd. & Paul Ave.	8	0	+ 1	N.L.

<u>RANK #</u>	<u>INTERSECTION HIGH ACCIDENT LOCATIONS</u>	<u>TOTAL ACCIDENTS</u>	<u>#PED. ACC.</u>	<u>CHANGE FROM 1992</u>	<u>POSITION 1992</u>
63	Bayshore Blvd. & Silver Ave.	8	1	- 3	31
63	Divisadero St. & Geary Blvd.	8	0	- 2	40
63	Duboce Ave. & Guerrero St.	8	0	- 2	40
63	Fillmore St. & Oak St.	8	0	0	87
63	Fulton St. & Park Presidio Blvd.	8	0	+ 2	N.L.
63	Geary St. & Hyde St.	8	0	- 1	61
63	Geary St. & Jones St.	8	1	+ 3	N.L.
63	Mission St. & Silver Ave.	8	3	- 2	40
63	Mission St. & Valencia St.	8	0	+ 5	N.L.
63	Oak St. & Steiner St.	8	1	+ 6	N.L.
63	Pacific Ave. & Van Ness Ave.	8	0	+ 1	N.L.
63	Sunset Blvd. & Vicente St.	8	0	+ 6	N.L.

For 1993 this list includes all intersections with 8 or more reported accidents.

A total of 95 intersections on the list.

52 new intersections on 1993 list with 508 accidents.

Those intersections had 246 accidents in 1992.

64 intersections with 637 accidents in 1992 dropped from the list.

These intersections had 297 accidents in 1993.

N.L. = Not listed on 1992 high accidents list.

Army Street Circle includes Army Street between Hampshire Street and Vermont Street, Bayshore Boulevard, north of Marin Street and Potrero Avenue north of Army Street

Does NOT include accidents coded as "intersection" at

- Army Street & Hampshire Street
- Army Street & Kansas Street
- Army Street & Vermont Street
- Bayshore Boulevard & Jerrold Avenue
- Bayshore Boulevard & Marin Street
- Bayshore Boulevard & U.S. 101 off-ramp

Does include accidents coded as "intersection" at

- Army Street & Bayshore Boulevard
- Army Street & Potrero Avenue
- Army Street & U.S. 101 on-ramp (N/B & S/B)
- Bayshore Boulevard & Potrero Avenue

Does include accidents coded as "mid-block" at

- (all Army Street locations in between)
- Army Street east of Hampshire Street
- Army Street west of Vermont Street
- Army Street west of U.S. 101 S/B on-ramp
- Bayshore Boulevard south of Army Street
- Bayshore Boulevard north of Marin Street
- Potrero Avenue north of Army Street
- Potrero Avenue north of Bayshore Boulevard

SF POLICE BICYCLE ACCIDENT DATA (1989-93)
TOTAL BICYCLE ACCIDENTS BY MONTH FOR FIVE YEAR PERIOD

MONTH	NO OF ACCIDENTS	PERCENT
JANUARY	151	6.420
FEBRUARY	170	7.220
MARCH	176	7.480
APRIL	221	9.390
MAY	204	8.670
JUNE	185	7.860
JULY	189	8.030
AUGUST	230	9.770
SEPTEMBER	234	9.940
OCTOBER	224	9.520
NOVEMBER	192	8.160
DECEMBER	177	7.520
TOTAL	2,353.00	99.980

SF POLICE BICYCLE ACCIDENT DATA (1989-93)
TOTAL BICYCLE ACCIDENTS BY DAY OF WEEK
FOR FIVE YEAR PERIOD

DAY	NO OF ACCIDENTS	PERCENT
SUNDAY	246	10.45
MONDAY	314	13.34
TUESDAY	387	16.45
WEDNESDAY	380	16.15
THURSDAY	381	16.19
FRIDAY	395	16.79
SATURDAY	250	10.62
TOTAL	2,353.00	99.99

SF POLICE BICYCLE ACCIDENT DATA (1989-93)
TOTAL BICYCLE ACCIDENTS BY TIME OF DAY
FOR FIVE YEAR PERIOD

HOUR OF DAY	NO OF ACCIDENTS	PERCENT
0:00 - 0:59 AM	19	0.81
1:00 - 1:59 AM	11	0.47
2:00 - 2:59 AM	12	0.51
3:00 - 3:59 AM	6	0.25
4:00 - 4:59 AM	3	0.13
5:00 - 5:59 AM	4	0.17
6:00 - 6:59 AM	27	1.15
7:00 - 7:59 AM	90	3.33
8:00 - 8:59 AM	136	5.78
9:00 - 9:59 AM	117	4.97
10:00 - 10:59 AM	122	5.18
11:00 - 11:59 AM	136	5.78
12:00 - 12:59 PM	177	7.52
1:00 - 1:59 PM	162	6.88
2:00 - 2:59 PM	198	8.41
3:00 - 3:59 PM	187	7.95
4:00 - 4:59 PM	236	10.03
5:00 - 5:59 PM	246	10.45
6:00 - 6:59 PM	161	6.84
7:00 - 7:59 PM	99	4.21
8:00 - 8:59 PM	66	2.80
9:00 - 9:59 PM	54	2.29
10:00 - 10:59 PM	49	2.08
11:00 - 11:59 PM	35	1.49
TOTAL	2,353.00	99.48

SF POLICE BICYCLE ACCIDENT DATA (1989-93)
TOTAL BICYCLE ACCIDENTS BY TIME OF DAY
SATURDAY
FOR FIVE YEAR PERIOD

HOUR OF DAY	NO OF ACCIDENTS	PERCENT
0:00 - 0:59 AM	6	2.40
1:00 - 1:59 AM	5	2.00
2:00 - 2:59 AM	4	1.60
3:00 - 3:59 AM	2	0.80
4:00 - 4:59 AM	1	0.40
5:00 - 5:59 AM	0	0.00
6:00 - 6:59 AM	1	0.40
7:00 - 7:59 AM	5	1.00
8:00 - 8:59 AM	5	2.00
9:00 - 9:59 AM	5	2.00
10:00 - 10:59 AM	13	5.20
11:00 - 11:59 AM	16	6.40
12:00 - 12:59 PM	28	11.20
1:00 - 1:59 PM	21	8.40
2:00 - 2:59 PM	20	8.00
3:00 - 3:59 PM	23	9.20
4:00 - 4:59 PM	20	8.00
5:00 - 5:59 PM	27	10.80
6:00 - 6:59 PM	11	4.40
7:00 - 7:59 PM	10	4.00
8:00 - 8:59 PM	5	2.00
9:00 - 9:59 PM	5	2.00
10:00 - 10:59 PM	10	4.00
11:00 - 11:59 PM	7	2.80
TOTAL	250.00	99.00

SF POLICE BICYCLE ACCIDENT DATA (1989-93)
TOTAL BICYCLE ACCIDENTS BY TIME OF DAY
SUNDAY
FOR FIVE YEAR PERIOD

HOUR OF DAY	NO OF ACCIDENTS	PERCENT
0:00 - 0:59 AM	2	0.82
1:00 - 1:59 AM	1	0.41
2:00 - 2:59 AM	4	1.64
3:00 - 3:59 AM	2	0.82
4:00 - 4:59 AM	0	0.00
5:00 - 5:59 AM	0	0.00
6:00 - 6:59 AM	1	0.41
7:00 - 7:59 AM	2	1.00
8:00 - 8:59 AM	2	0.82
9:00 - 9:59 AM	10	4.10
10:00 - 10:59 AM	15	6.15
11:00 - 11:59 AM	7	2.87
12:00 - 12:59 PM	22	9.02
1:00 - 1:59 PM	24	9.84
2:00 - 2:59 PM	23	9.43
3:00 - 3:59 PM	24	9.84
4:00 - 4:59 PM	26	10.66
5:00 - 5:59 PM	31	12.70
6:00 - 6:59 PM	13	5.33
7:00 - 7:59 PM	13	5.33
8:00 - 8:59 PM	12	4.92
9:00 - 9:59 PM	3	1.23
10:00 - 10:59 PM	6	2.46
11:00 - 11:59 PM	1	0.41
TOTAL	244.00	100.21

SF POLICE BICYCLE ACCIDENT DATA (1989-93)
TOTAL BICYCLE ACCIDENTS BY TIME OF DAY
TUESDAY THROUGH FRIDAY
FOR FIVE YEAR PERIOD

HOUR OF DAY	NO OF ACCIDENTS	PERCENT
0:00 - 0:59 AM	12	0.78
1:00 - 1:59 AM	4	0.26
2:00 - 2:59 AM	4	0.26
3:00 - 3:59 AM	1	0.06
4:00 - 4:59 AM	1	0.06
5:00 - 5:59 AM	3	0.19
6:00 - 6:59 AM	19	1.23
7:00 - 7:59 AM	69	4.47
8:00 - 8:59 AM	105	6.80
9:00 - 9:59 AM	92	5.96
10:00 - 10:59 AM	80	5.18
11:00 - 11:59 AM	94	6.09
12:00 - 12:59 PM	102	6.61
1:00 - 1:59 PM	99	6.42
2:00 - 2:59 PM	129	8.36
3:00 - 3:59 PM	121	7.84
4:00 - 4:59 PM	164	10.63
5:00 - 5:59 PM	156	10.11
6:00 - 6:59 PM	107	6.93
7:00 - 7:59 PM	61	3.95
8:00 - 8:59 PM	40	2.59
9:00 - 9:59 PM	35	2.27
10:00 - 10:59 PM	23	1.49
11:00 - 11:59 PM	22	1.43
TOTAL	1,543.00	99.97



APPENDIX B

BASE CONSTRUCTION COST ESTIMATES

SUMMARY OF PUBLIC COMMENTS



APPENDIX B-1

BASE CONSTRUCTION COST ESTIMATE ASSUMPTIONS

Improvement	Unit	Unit Cost ⁽¹⁾
Install Sign (new/existing pole)	One Pole	\$150/\$100
Remove Sign	One Pole	\$45
Bike Lanes ⁽²⁾	Mile	\$8,170
Bike Route ⁽³⁾	Mile	\$1,470
Remove and Stripe New Lane Line ⁽⁴⁾	Mile	\$6,000
Construct Bike Path	sq. ft.	\$4.00
Install Bike Path Crossing-Special Surface	sq. ft.	\$2.60
Curb Cuts	Cut	\$900
Traffic Calming Measures	Mile	\$1,000-\$75,000
Signal Modifications ⁽⁵⁾	Pole	\$5,400
New Traffic Signal	Location	\$100,000
Flashing Yellow Beacon	Pole	\$5,400
Lighting	Pole	\$3,500
Fence - 54 inches high	Linear Foot	\$30
Jersey Barriers	Linear Foot	\$45
Retaining Wall ⁽⁶⁾	Linear Foot	\$250

(1) Includes labor, materials and overhead.

(2) Includes bike lane line @ \$1.50 per foot, bike lane pavement legend @ \$5/sq. ft. and bike lane sign and route signing @ \$145 per installation.

(3) Includes bike route signing, directional signing and bicycle symbol pavement legend.

(4) Cost includes removal of lane line at \$2.00 per linear foot, and striping of a 4-inch dashed white thermoplastic stripe at \$0.60 per linear foot. Assumes 7 linear feet per 24 feet of roadway length.

(5) Bicycle signal heads and left-turn phasing. Assumes existing controller and average conduit length of 75 feet at \$45/foot.

(6) Assumes average of 4 feet in height.

Source: San Francisco Department of Public Works and Department of Parking and Traffic.

Wilbur Smith Associates; March 1994



APPENDIX B-2

SUMMARY OF PUBLIC COMMENTS

Summary of Comments Received on Proposed Commute Routes

Summary of both written and oral comments received to the proposed bike route map by the Department of Parking and Traffic. For the purpose of consideration, comments are categorized as follows: Comments about process or purpose; general map suggestions; specific comments on proposed routes; proposed new routes; comments about routes/lanes/signage; education/safety related suggestions; and other suggestions and comments. If the exact comment was made more than once, it was only listed the first time it was made.

I. Comments about process or purpose

1. I wonder how much consideration was given to selecting streets that are relatively free ~~from~~ traffic. Is there some consideration to protecting bicyclists on the very busy streets, like banning cars from Market?
2. Most routes follow the path of least resistance, and so do most automobiles and busses. There are alternate routes that are better.
3. There are numerous bicyclists in the Mission District who may have comments but are unaware of the proposal. They are non-English speaking and you should keep this community in mind because they may have special needs.
4. Concern that roads not designated will not be maintained.
5. Don't call the routes "commute" or "Recreational". Put all routes on one map.
6. Ditch comprehensive design, survey which streets are used, E-W across northern City use Clay to Broadway, or McAllister, Golden Gate, up Steiner to Post, then California.
7. More routes should be proposed. Designate both fast and congested routes and pleasant but slow.
8. Conduct a survey of SF commuters to assess the size and nature of the existing and potential bicycle commuting population.
9. There are many major destination points that are 1/2 to 1 mile from the nearest route.
10. Every single bike-accessible Class 3 route ought to appear on the map.
11. Prefer routes that avoid traffic and hills.
12. Suggested change from "destination" oriented to "pleasure" oriented.

II. General map suggestions

1. Include markings indicating the steepness of hills
2. Recommends Map key to indicate route numbers, north-south, and scale.
3. Recommendation to fold the map like a map (rather than like a brochure).
4. Need more street names on map, particularly in southern sections.
5. CalTrain should be shown on the map and connected with a dotted line like BART.
6. The route numbering system should reserve some route numbers for inter-city routes. I would like to see a uniform numbering system used throughout the Bay area, and that would benefit cyclists who want to ride between several city boundaries (i.e., from San Francisco to the Airport). If used this way, the routes totally within San Francisco should have a SF prefix.
7. The map needs to provide more information; grade, volume and speed of traffic, width

and number of lanes, route category.

8. Show different types of routes in multiple colors (e.g. green for no stop signs and low traffic, red for narrow right lanes and bad traffic).
9. Impassable zones could be a special texture (such as interstate highways, Telegraph Hill cliffs, etc.)
10. Use different colors to indicate problem areas.
11. Note route types, not by Class I, II, or III, but instead by "suitable for beginner, intermediate, or advanced". See Sunnyvale map.
12. Add comments pointing out particular dangers and opportunities.

III. Specific Suggestions on Proposed Routes

Route 5

1. Add a bike lane on both sides, on Third Street into Embarcadero into Fisherman's Wharf.
2. Recommend 3rd St. to King St. to the Embarcadero.
3. The new Embarcadero street doesn't have enough room for a bike lane. Will the west side have more room?
4. Deletes most of 3rd Street, instead takes China Basin, and Illinois St to 3rd, to Cargo, to Mendel to 3rd to Keith to 3rd.

Routes 5 and 10

1. Recommends cyclists stay on Embarcadero rather than Northpoint and Francisco.

Route 10

1. The Bay, Cervantes, Francisco connection should show Alhambra before Francisco.

Routes 10 and 95

1. Recommends Clement to 30th Avenue to Lake, rather than taking longer route that goes along El Camino around the Legion of Honor Museum.

Route 15

1. Consider Grant or Sansome northbound rather than Kearny.

Route 16

1. Lake Street route should not end at Arguello, instead jog over to Clay and continue to Fillmore. Then jog over to Pacific and end at Route 25 on Polk.

Route 20

1. Turk and Golden Gate, one way arrows should be reversed.
2. Continue Balboa to the Great Highway.
3. Continue Turk and Golden Gate east to Market.
4. From Gough to Market, Bush is faster and safer than Post.

Route 20 and 30

1. Recommends riding through Park and Panhandle, up Baker to Golden Gate, and Golden Gate downtown. Riding west, McAllister replaces Golden Gate.

2. Recommends using McAllister from Market to Baker and not using Sutter/Post and Balboa.
3. Golden Gate Route eastbound should not detour at Webster.

Route 25

1. Route is difficult with freeway on ramps, practically no warnings, and bicycles in deadly peril from 55 mile/hour traffic. The Bayshore Blvd stretch between Army and Alemany is not built for bicyclists.
2. Consider Hampshire rather than Potrero.
3. Army Street interchange route is to slow, out-of-the way, etc. Instead use the actual interchange but slow down the vehicles to 15 mph.
4. The north end of Potrero is tricky. Easier to go Potrero, Brannan, 9th.
5. I prefer Polk, both ways, to Larkin.
6. Remove extra southbound lane on Polk.
7. Delete Evans, Toland section.

Route 30

1. The first block of Duboce off Market is one-way, east to west.
2. Panhandle path, let's see to it that a safe passage, well-marked, is effected going East from Kennedy Drive.
3. Why take Fell from Scott when Page is quiet, lightly travelled, and pretty?
4. Substitute Page for Oak and Fell.
5. Take route out of the Panhandle as far west as possible and use Hayes Street instead, also consider Page St.
6. Keep Duboce going West but use Page going east.
7. Close Duboce between Market and Church to autos and convert to bicycle facility.
8. Give bicyclists a lane on Oak street to get from the Panhandle to Scott to Page.
9. Give bicyclists the left hand lane on Fell Street from Scott to Baker.
10. Oak St. should be used eastbound regardless of heavy traffic. Fell and Oak Streets between Baker and Scott should have street parking eliminated on one side in favor of a striped bike lane.
11. I take Scott to Hayes to avoid Fell. I prefer this to Page.
12. The switch to Hayes is not realistic. Take Oak or Page. Maybe a bike crossing sign and crosswalk at Page and Divisadero.
13. Prefer Oak to Hayes. Connect Scott to Waller.

Route 40

1. Take Harrison rather than Howard from SOMA to Mission. The freeway on-ramp just past 12th street at Howard is extremely dangerous.
2. Consider taking 18th Street between Potrero and the Castro rather than 16th, or 14th and 15th. 16th Street through the Mission can get pretty crazy.
3. I recommend 17th over 16th.

Route 40 and 45

1. The corner of 16th and Valencia is one of the most dangerous in the City.

Route 45

1. Why not mark a bicycle lane on Valencia?
2. Recommends avoiding heavy traffic on Valencia by taking Valencia to 23rd St, 23rd to Church, Church to Chenery.
3. Into Glen Park, instead of Arlington to Bosworth, consider Arlington to Wilder, right on Wilder, left on Diamond, and then left or right to Bosworth.
4. Tiffany Avenue is a quiet shortcut. Eliminate street parking on San Jose between Randall and Bosworth.
5. Removing median on Valencia is not enough. Remove a parking lane.
6. At southern end of Valencia, take Tiffany to 29th not Duncan.
7. Remove one or two motor vehicle lanes on Valencia.

Routes 45 and 98

1. Taking Alemany over the 280 expressway, it is not easy to accomplish the cross over 280 into Brotherhood way. It is more scenic and relaxing to take the Hillcrest Drive route.

Route 50

1. Market Street is not bike friendly during peak hours, especially in the morning between 2nd and 5th Streets, Mission is more comfortable during these times. Market can be considered bike-friendly during off-peak hours and on the weekend, but during the commute rush it is suitable only for the most expert cyclist.

Route 55

1. Masonic (Turk to Geary) too busy for bicycles with fast and narrow lanes, need an alternate route.
2. Consider Cole St. and Carmel (at the top of the hill) as an alternative or in addition to Downey and Ashbury.
3. Rather than take the cluster of roads that occupy the area around Masonic, Geary, bush and Pine, take Masonic to Geary to Presidio.
4. Presidio from Pine to Geary and Geary to Masonic, rather than Masonic.

Route 60

1. From Noe Valley to Market Street, rather than Clipper to Portola, Ride west on 24th Street, turn right on Diamond, left on 23rd, right on Eureka, take Eureka to Market.
2. Rather than Army Street, use 26th Street because of less traffic.
3. Opposed to Clipper and Army. Market to 24th to Valencia to 25 to Potrero.

Route 65

1. Washington Blvd at Lincoln should be one way (north) and new one way (south) route should be added through Fort Scott.
2. Recommends 8th Avenue between Dewey and Lincoln rather than 7th Avenue.
3. It is illegal to go South on Washington at Lincoln.
4. Consider 2nd Avenue rather than Arguello

Route 70

1. O'Shaughnessy needs markings to tell cyclists to get off the road and take the sidewalk trail.
2. O'Shaughnessy Blvd. should be street swept at least once a month.
3. Where Alemany runs south from Farmers Market to Justin Drive the west side is frequently cluttered with garbage and needs cleaning.
4. Dewey to Portola via Claremont - removal of the stop sign on Claremont will eliminate half of the impact of the steep grade.
5. Use Oakdale rather than Palou from Third to Bayshore. East of Third, Palou is better than Oakdale. Extend Industrial all the way to Oakdale. Designate Phelps from Oakdale to Evans, and Evans, all the way from Army to Innes. Extend the route to the Shipyard.
6. Opposed to Alemany section.

Route 90

1. Reconsider the inclusion of Ocean Avenue, the pavement is some of the worst in SF.
2. The intersection of Ocean and Geneva is narrow, steep, and dangerous. A better route would be Monterey Blvd. with a detour south of Genessee St. for access to City College.
3. Consider Holloway rather than Ocean.

Route 95

1. Along Great Highway south past the Zoo and Waste Facility Plant needs much more protection for the bicyclist.

IV. Proposed New Routes

Specific Destinations

1. Add new route to California Pacific Medical Center (and change name on map - map incorrectly says Pacific Presbyterian Med. Center) -- from Civic Center, go West on McAllister, North on Fillmore, east on Washington.
2. There should be a route linking CalTrain at 4th and Townsend to the Civic Center.
3. If possible, there should be a route to Candlestick Park.
4. Need route to SF State.
5. A route to the airport along Tunnel Avenue should be included.
6. Need routes to Caltrain stations.
7. Need spur routes to Candlestick Park, SF State, UCSF, Zion, Kaiser, French, Davies, Chinese and St. Francis Hospitals.
8. The back route to City college using Circular Street should be designated.
9. Caltrain to Civic Center, probably Townsend to 7th to market.
10. SF State proposal - see maps presented by students.

North/Northeast

1. Suggested additional route between North Beach and Russian Hill to Pacific Heights, Laurel Heights and Richmond. Specifically: Pacific between Polk and Fillmore, Fillmore between Pacific and Jackson, Jackson between Fillmore and Presidio, Presidio between Jackson and Clay, Clay between Presidio and Arguello.

2. Suggested Pacific Heights route: Westbound, from Polk and Pacific, west on Pacific to Webster, Fillmore, Steiner. Proceed south to Jackson, west to Presidio, south to Clay, west on Clay to Arguello, to Lake. Headed east, Sacramento to Locust, Clay to Steiner.
3. Add new section connecting Route 16 to Route 20. Sacramento (at Arguello) East to Scott, Scott South to Post to Route 20 (on return Sutter to Scott).
4. Crossing the city from Arguello and Lake, Sacramento to Presidio, to Post, to Webster, to Golden Gate, to Polk, to Civic Center.
5. Consider the addition of West Pacific Avenue to the plan.
6. West of Arguello, Lake, Geary, Anza and Fulton should all be designated.
7. Connect Post and Sutter with Presidio, then designate Euclid which connects with Arguello.
8. Pacific between Davis and Webster, south to Sacramento, west to Arguello, connecting with Lake Street route.
9. Add a route between Arguello and Polk through Laurel and Pacific Heights. Beginning at Arguello and Clay, east on Clay to Masonic. At Masonic/Presidio (or Lyon) turn north to Jackson, east on Jackson to Fillmore. At Fillmore turn north one block and then east on Pacific all the way to Polk.
10. North of Bush routes are deficient. Broadway with the tunnel should be added or Pacific. Webster should be included from Duboce to Pacific or Broadway. Clay, California or Sacramento should link Webster with Presidio.
11. Fort Mason should be connected to the Presidio. Using Old Mason St. in the Presidio will also assist commuters in providing easy access to the Bridge.

Sunset

1. Add a route in the Sunset along Judah connecting Route 65 at 7th Avenue to the Great Highway, and a route along Taraval connecting to Route 65 (at Dewey) to the Great Highway. (give good coverage to Sunset commercial areas)
2. Eucalyptus eastbound would make an excellent route if the eastbound parking lane was eliminated and a stop-sign free lane or path was created.
3. An E/W route through the Sunset is needed.
4. The Lake Merced Loop should be given some type of designation to provide safer riding.

South/Southeast

1. Add a route from Glen Park BART along Monterey Blvd to Santa Clara Street and extending Route 50 along St. Francisco to Santa Clara. (flatter and more direct from Glen Park to Stern Grove and Parkside)
2. An additional route west of the 280 freeway and leading to City College would be useful. From San Jose going south, take wilder to Diamond to Circular Avenue. A connection to Rt. 90 can be made via Judson and Phelan Avenues, or via Havelock Avenue and on through the campus to Ocean Avenue.
3. An additional route through Bernal Heights along Cortland Avenue connecting Routes 25 and 45 would be useful.
4. New route from Market and Eureka, Eureka to 23rd, to Diamond, to 24th, to Church, to 30th, to Chenery, to Diamond, then going either on Monterey to Santa Clara to St. Francis to meet routes 50 and 65, or from Diamond going south to City College via Judson and Phelan and then connecting to route 90 on Ocean Avenue.

Central City/Haight/CG Park

1. Add a new route into Golden Gate Park, taking Duboce to Roosevelt to Shrader to Carl, to Arguello, to Irving to 6th Avenue (meets Route 65).
2. Add a new route up and down Page Street.
3. Around the Panhandle, Hayes, Fell, Oak, Panhandle, and Page can be effective.
4. Page St. eastbound from Stanyan to Scott, and probably all the way to Market should be designated as a route and stop signs eliminated.
5. Chain of Lakes needs improvements for bicycles.
6. Endorse Rec and Park Recommendation that left hand turns from east bound Martin Luther King onto north bound Crossover Drive be restricted and that the left turn lane be relocated to 19th Avenue and Lincoln Way.
7. There's a useful one along the Buchanan St. Mall between Turk and Grove that's not on the map.
8. There's another wiggle that connects the Civic Center with northeast Richmond that should appear (also a candidate for traffic calming).

Downtown/SOMA/Mission

1. In the Mission, add new routes on Harrison from Army to 11th, and on 20th Street from Church to Potrero.
2. SOMA, add new routes on Townsend and 11th Street.
3. Add route from 18th Street and Douglas to 20th and Folsom (in either direction), following 18th, Diamond, 19th, Church, and 20th.
4. From the Mission to SOMA, Townsend to the round-a-bout at 8th, then Kansas to 17th.
5. Mission westbound from Embarcadero to Van Ness during rush hour has a huge right la that could easily accommodate a painted bike lane.
6. Harrison between 10th and Army is wide, lightly traveled, and smooth.
7. In the Mission and Potrero, a cross town route from Third to Market is needed (Consider 17th or 16th) or Mariposa/Mississippi/17th).
8. Connect Mission to Downtown via Harrison from 10th to Army and remove third motor vehicle lane.
9. Need E/W route to connect Mission, Potrero Hill, Dogpatch, Bayshore and 22nd St CalTrain station. 16th or 17th to Mississippi, to Mariposa to 3rd. From Mariposa, south or Indiana to Caltrain.
10. Market and Eureka to 18th to Valencia to 20th to Potrero.
11. Townsend (from Embarcadero) to 17th to Hampshire to 25th (southbound), using Potrero going northbound.
12. Potrero Hill local access from Potrero, 18th Street to Connecticut to 16th.
13. Extend 16th street to Illinois.

V. Routes/lanes/signage

1. Recommends signage to warn drivers that this is an official bike route and to watch for cyclists.
2. Pavement markings and signs can help promote road sharing. When the bike route is on a narrow right lane, pavement markings should be employed to encourage motorists to pass the next lane. These markings should be large enough to be seen.

3. Share the road signs should be placed on busy streets beyond bike route turnoffs to protect cyclists who stay on the busy streets.
4. Signs and markings on less busy routes can be less visible. An attractive pavement marker should be presented for approval to Caltrans.
5. The routes should be clearly marked bicycle lanes.
6. All routes should have prominently situated signs indicating that the marked lanes are designated specifically for bicycles.
7. On a regular basis, set aside prominent roadways for non-motorized commuting only.
8. Bicycle lanes need to be established along routes. Sign posts stating "bicycle route" are useless and a waste of funds.
9. There should be consistent policies and enforcement on asphalt and pavement consistency.
10. Make all diamond lanes (for buses) also for bikes.
11. Lanes should be marked with route numbers and arrows, etc. Better than signs.
12. Recommendation for wide curb lanes - map with proposed lanes marked throughout the city.

VI. Education/safety related suggestions

1. Recommend public information campaign to remind drivers that bicycles belong on the road and are entitled to the entire lane, and to watch when opening car doors. Re-educate bicyclists on proper etiquette.
2. Motorist education is needed.
3. Recommends a new safety tip, "ride at least a car doors width away from parked cars. Take the lane if necessary for safety. Watch for pedestrians crossing between cars." Rather than "observing stop signals" recommends "stop signs and stop lights are necessary for control of motor vehicles. Treat them as yield signs - slow and continue with caution."
4. On back side add more information on what to do when confronted with aggressive non-cyclists and accident information (who to contact, cyclists rights, liabilities, etc.).
5. Educate motorists about cyclists - particularly MUNI drivers.

VII. Other comments/suggestions

1. We need more bike parking downtown and throughout the City. Isn't it possible to get lockers for a few of the parking places in City lots?
2. There should be more bike racks throughout the City, not the Rack III's, they are useless.

Route Map Changes Approved by the BAC on February 23, 1995
(Changes to route map recommended by ad hoc committee on 2/15/95)

1. Between Jersey and 22nd add Chattanooga and delete Church, and delete Elizabeth entirely (use Jersey only).
2. Extend Carroll street route one block to Third Street.
3. Keep bridge over Islais creek but indicate it as a low priority for city funding.
4. Use Clay all the way to Webster (delete Jackson).
5. Recommend that GGNRA establish the Lands End road as a non-paved bicycle route (rather than indicating it as a future study path).
6. Designate the Embarcadero as a Class I route.
7. Leave Crissy Field as is -- modify in future with Crissy Field plan.
8. Designate Bay street westbound between Van Ness to Laguna, and Van Ness between North Point and Bay.
9. Do not include 25th Street overpass (no change to map).
10. Extend Potrero to Army Street
11. Include San Jose from Valencia to Monterey
12. [Continuation of Jefferson to Aquatic Park done by ad hoc subcommittee]
13. Add Noe from 16th St. to Duboce, Duboce to Scott, and Scott to Clay Street. Delete Steiner from Fulton to Clay Street.
14. Retain 17th Street to Market. Delete Sanchez and 16th to Market.
15. Add left-hand turn from Market onto Franklin.
16. Add Taylor from Pacific to California (to join California to Polk); Delete Powell to Jackson and Jackson to Taylor.
17. Add Octavia between Greenwich and Green; Delete Gough between Greenwich and Green.
18. Add Diamond between Jersey and Clipper.

Summary from notes by Bert Glenn (typed 2/24/95)

COMMENTS ON
THE NON-ROUTE ELEMENTS OF
THE SUMMARY OF THE DRAFT BICYCLE MASTER PLAN

Public Meeting
New College, 777 Valencia Street
January 24, 1995

50+ people attended over the course of the evening

- opposed to bulbing because forces bicycle closer to cars
- suggested allowing bicycles to ride over any bulbing
- traffic calming suggestions should be more specific
- traffic lights should be timed to slow cars and should be green longer to allow pedestrian crossing
- reduce conflict on bike paths (ie Panhandle) between bikes and pedestrians and dogs
- dogs should be leashed in parks
- bike paths should be striped to create lanes
- bike lanes should be placed far enough away from parked cars so that car doors will not be in them
- on bike priority streets, fast and slow moving bikes should be separated out
- master plan should be specific about how safety considerations are different for different bike facilities
- assaults on bicyclists/what to do?
- plan should include ways how it can be implemented
- other city departments should refer to the plan when doing their work
- land use issues should be discussed, ie incentives should be given to create concentrations of bicycle-related businesses
- plan should be implemented/how?
- SFBC and BAC should review entire plan before submitting it to DPT or Board of Supervisors
- agrees with plan to include DMV attachments (ie yield right of way to bikes, driver education)
- law in Los Alamos, NM, that motorists can only pass if have 5' clearance
- motorists should drive in less threatening way
- agrees with plan to cooperate with GGNRA and the Golden Gate Bridge
- railing should be added to Bay side of the Golden Gate Bridge
- stop signs should be amended with "cyclist yield"
- add as routes: Mission, Market, Howard streets
- Market Street bike lane should be continuous and the right lane should not be constricted (as it often is at intersections)
- Market Street should have more space for bikes
- signs should be placed in neighborhoods identifying locations where people may meet to bike together (small "critical masses")
- there should be pedestrian zones (ie Market Street)
- can the plan be more innovative?

- is political pressure required to implement this plan?
- can there be another public meeting to review the entire plan?
- riding in the bus lane is already legal
- we should not assume that investing in bicycle facilities will increase bike use
- bike lanes should not be created because they are not safe
- adult bicyclists should be targeted for education (as in the work of the Motorcycle Safety Foundation), not the public at large
- add "bikes yield" to stop signs on bike priority streets
- do not use traffic circles
- neighborhoods should support traffic calming before it is implemented
- there should be a route parallel to Bay Street in Ft. Mason
- we should be vigilant about the Crissy Field redesign
- D-shaped grates only should be used (they can only be put in one way)
- logos and different colors should be used to mark routes on the pavement
- bike racks should not be used
- businesses should be given incentives to provide showers and bike parking so that it costs them nothing
- bike lockers used should be able to take same lock (ie u-lock) that most people already carry (to make more usable)
- DMV tests are being reformatting right now, so we should act
- bike facilities should be piggy-backed on larger projects
- bike facilities should be provided
- for education, Gannett should donate space and we should take advantage of pro-bono advertiser work
- bike network is only as good as the car network
- in selection of routes, priority should be given to safe, flat routes, not the routes that least inconvenience motorists
- traffic calming and barriers should be specifically defined and located within the plan so that they may be legally implemented
- media attention and civil disobedience should be used to improve conditions for bicycling
- we need not have political hegemony
- wants to review full plan before DPT adoption
- motorists should be educated
- schools should include bike parking (which was removed)
- bike parking is needed (downtown? in garages?) and there should be a charge for it (not for street racks)
- bike shops should educate their customers (ie give out pamphlets on kids wearing helmets and safe city riding)
- most favors traffic calming measures because the main problem facing bicyclists is volume and speed of cars: use of cars should be discouraged and their speed reduced
- law enforcement should be reeducated to see rights and needs of bicyclists
- there should be lockers in BART underground
- numbers of lockers suggested for 16th and 24th Street BART stations should be increased
- more cops on bikes
- maps should include locations of bike lockers
- bike lane suggested between parked cars and curb (as in Berlin & Eugene)

- Market Street should be closed to cars
- prefers traffic calming and sharing of the road, since number one problem is speed and volume of cars
- bike visibility should be increased at intersections
- opposes idea of altering stop signs (as "special rights" for bicyclists that may incur motor anger)
- share the road
- police should be educated (ie that bikes can take a lane)
- education should break stereotypes of bikes as recreational and to increase understanding of bike messengers' working conditions



APPENDIX C

ESTIMATED TIMING OF PROPOSED IMPROVEMENTS



APPENDIX C

ESTIMATED TIMING OF PROPOSED IMPROVEMENTS

Phase I - 1 to 12 Months

- ▶ Install signing and pavement legend
- ▶ Stripe bicycle lanes (no other striping required)
- ▶ Restripe to provide wide curb lanes
- ▶ Restripe to stripe bicycle lanes (no lane reduction)

Phase II - 1 to 3 Years

- ▶ Travel lane removal to stripe bicycle lanes
- ▶ Install traffic signals
- ▶ Bicycle path construction/widening
- ▶ Modify STOP signs and Traffic Calming where necessary

Phase III - 3 Plus Years

- ▶ Construct pedestrian/bicycle bridge
- ▶ Bicycle path construction/widening
- ▶ Broadway Tunnel improvements
- ▶ Bicycle signal phasing
- ▶ Modify STOP signs - Traffic Calming where necessary



APPENDIX D

***City of Montreal's
Coloured Bike Path Crossing Demonstration Project***

***City of Denver's
Bicycle Pavement Symbol***

DESCRIPTION OF THE CITY OF MONTREAL'S DEMONSTRATION PROJECT FOR COLOURED BIKE PATH CROSSING

The City of Montreal, in a joint project with the Ministry of Transport and VeloQuebec, has undertaken a research project to improve bike safety where bike paths cross intersections. First they looked at what other cities have done, particularly in Europe. They found that several European cities do use color to mark bikeways both adjacent to roads and through intersections. Denmark uses a bright blue marking and Holland uses red colored asphalt.

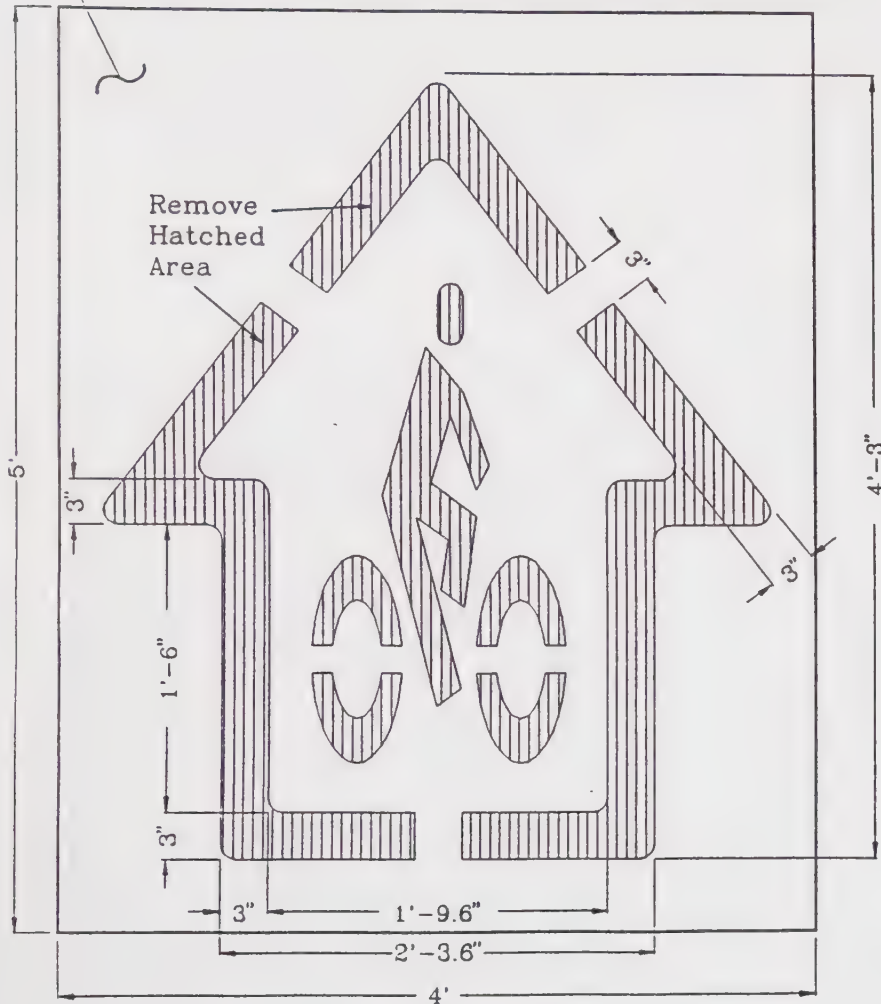
Montreal chose to use a bright blue polymer epoxy paint to which sand has been added to increase traction. They applied the colored pavement surface at the extension of the bike path at the point in an intersection where a bike must travel to cross the intersection. The colored pavement treatment was applied at five intersections, and before and after studies were conducted. The studies focussed on two issues: 1) bicyclist and motorist behavior and 2) material properties. (The behavioral studies and analysis are being conducted by the Department of Psychology of the University of Montreal.) A full report on the before and after studies is expected in January 1995.

The colored pavement is installed by scraping the existing asphalt surface 1/16 to 1/8 of an inch. The liquid is then applied to the pavement. Two to three coats were found to be necessary, but the second and third coats can be applied with a roller. The work was performed by a private contractor at a total cost of Canadian \$2.25 per square foot, including the scraping of the asphalt. Signs and additional bikeway markings are not included in this price.

Source: Personal communication with Robert Desjardins, City of Montreal, 11/17/94.

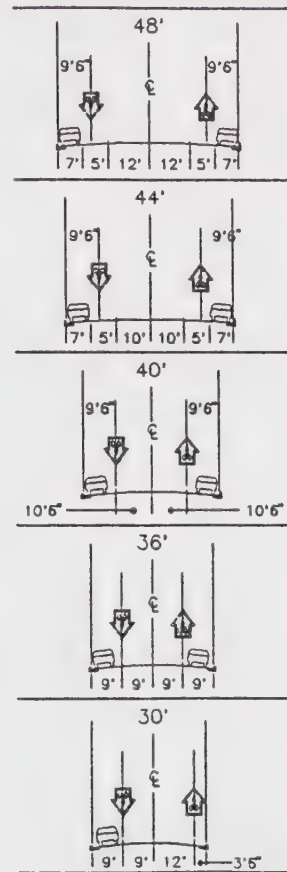
Bicycle Pavement Symbol

Material: 1/8" Thick, Low Density Poly Ethylene



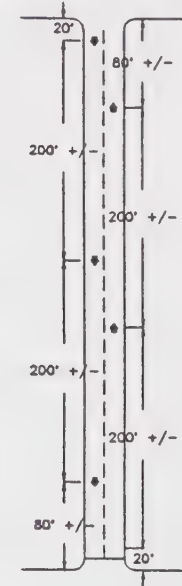
LAYOUT PROCEDURE FOR BICYCLE PAVEMENT MARKING STENCIL

TYPICAL STREET CROSS SECTIONS

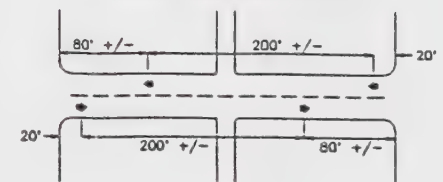


TYPICAL STREET CROSS SECTIONS

PLAN VIEW
TYPICAL NORTH-SOUTH STREET



PLAN VIEW
TYPICAL EAST-WEST STREET





APPENDIX E

NON-BICYCLE ORIENTED TRAFFIC CALMING MEASURES



APPENDIX E

NON-BICYCLE ORIENTED TRAFFIC CALMING MEASURES

The following pages describe traffic calming measures that are incompatible with or potentially harmful to bicyclists, as well as a few that are neither helpful nor harmful. As a rule, traffic calming plans, regardless of their purpose, should avoid incompatible measures where bicycle traffic is expected (which is just about everywhere except pedestrian malls and freeways), since there are many equally effective alternatives available.

MEASURES THAT HAVE LIMITED APPLICATIONS ON BICYCLE-PRIORITY STREETS

The first group of measures describe those that in some variations are not recommended for Bicycle Priority Streets. They provide no particular benefit to bicyclists, but they could benefit pedestrians in some applications. Thus, if limited in application and designed within the parameters described, they can be used in certain circumstances, as long as it is recognized that they are primarily pedestrian-oriented not bicycle-oriented.

Roadway Narrowing

Curb Extensions - Curb extensions, also known as peninsulas, bulbs, bulbouts, chokers, or neckdowns, are extensions of the sidewalk or landscaping, normally symmetrical on both sides of the street, that narrow the roadway, usually to the minimum required for two-way traffic. (Alternating bulbouts creates meandering roadways, described below.) At intersections, the extensions improve sight lines and reduce crossing width for pedestrians. At midblock, the extensions are often planted for aesthetic reasons and to discourage pedestrian crossings. The space between curb extensions can be used as parking bays. These measures provide less room for motorists and bicyclists to share the road. They are innocuous to bicyclists as long as they do not extend into the street beyond the width of a parked car.

A somewhat similar effect can be achieved through striping that reduces lane width or reduces the number of lanes approaching an intersection, at the cost of decreased compliance.

Bottlenecks - Bottlenecks, also called traffic throttles or pinch points, are similar to curb extensions, except that the roadway is narrowed to a single lane for both directions of travel.

Median Islands - These islands, sometimes called slow points, are another way to reduce roadway width, and also provide a refuge for pedestrians. In addition, they offset the lanes slightly toward the curb. Used within intersections, they can restrict turning movements (discussed further below).

Turn Restrictions

Left turn prohibitions are used extensively in San Francisco to prevent congestion on main streets that have no queuing space or cycle time to accommodate turns. Turn restrictions—without forced channelization—can also be used to prevent traffic from entering residential streets. Such restrictions have been adopted in the City of Walnut Creek to reduce cut-through traffic during peak hours. Less commonly, turn restrictions can be used to block or break up shortcuts within neighborhoods. In either case, to avoid hardship to residents the restrictions can be made effective only at certain hours.

Left-turn prohibitions from arterial streets are largely self-enforcing. The success of other signed turn restrictions depends on traffic patterns, driver acceptance, and enforcement, which must usually be frequent. These restrictions adversely impact bicycle circulation and are not recommended unless bikes are exempted. There is currently no explicit provision in California law for exempting bicycles from prohibitions that apply to vehicular traffic.

MEASURES THAT ARE NOT RECOMMENDED ON BICYCLE-PRIORITY STREETS

The following measures are not recommended as traffic calming techniques in general (except pedestrianization) as other measures described elsewhere can provide the same effects. They should absolutely never be used on a Bicycle Priority Street (except warranted STOP signs—which may, of course, be needed at major intersections).

Full or Partial Pedestrianization

Pedestrianization can be either full, as in an auto-free city center or transit mall, or partial, as in a Dutch woonerf. It is questionable whether reduced speeds in the woonerf can compensate for the increased hazard of shared vehicular and pedestrian surfaces. For the safety of bicyclists and pedestrians, bicyclists must travel at close to walking speed. A space with a 5 mph speed limit for bicycles cannot be considered a bicycle facility, and mixing pedestrians with high-speed bicycle traffic creates hazards too obvious to require elaboration. (Doubters may examine the U.C. Berkeley and Stanford campuses.) Although bicyclists can if necessary navigate these areas with care, they hold no particular advantage to bicycles. In fully pedestrianized areas it is reasonable to ban bicycles altogether.

Rumble Strips

A series of raised ridges or indentations formed or grooved in the roadway or shoulder. According to the Caltrans Traffic Manual, rumble strips must be three-quarters of an inch or less in height if raised, or one inch or less in depth if indented. The ridges may be formed from asphalt or from arrays of ceramic markers. Indentations usually consist of grooves rolled into the hot mix as part of a resurfacing project.

On roadways, rumble strips call attention to signs or alert drivers to a hazard by transmitting sound or vibration through the vehicle. They are often placed along the shoulder or edge of rural roadways or freeways to alert inattentive, drowsy, or intoxicated drivers, and they have also been used for residential speed control, usually in the form of ceramic markers.

Rumble strips are not suitable as a riding surface for bicycles, because they provide an extremely uncomfortable ride and can lead to steering difficulties, loss of control, and falls, especially when wet. They are used on state highways only when there is no other reasonable solution to an identified problem, and five feet of clear shoulder width for bicycles is available between the rumble strips and the outer edge of the shoulder. Rumble strips can also subject nearby residents to continuous noise and vibration, and motorists may make unusual maneuvers, such as driving in the gutter, to avoid them.

Instead of ridges or indentations, the State of Washington has used a chip-seal coat as a rumble strip between the roadway and a bike lane. This treatment appears to be equally effective in alerting motorists and does not pose a hazard to bicyclists if the excess gravel is removed.

Like speed bumps, which they resemble in miniature, rumble strips have little practical effect in slowing traffic, because the ride is actually smoother at higher speeds.

Meandering Roadways

Winding roads, also known as meandering, serpentine, or tortuous roads, are standard design practice in many new residential developments. The combination of increased distance with frequent changes of direction and reduced sight lines is effective in reducing vehicular speeds. Existing rectilinear roads can be converted to meandering roads by installing planters, bulbouts, islands, or parallel parking bays alternately on opposite sides of the street, or alternating parallel and diagonal parking. Size and placement of the bulbouts controls the degree of meandering. Milvia Street in Berkeley is a local example of an existing straight roadway that has been converted to a meandering one by alternating islands. (It also uses speed humps and special signing.) A meandering centerline can also be striped to reinforce the visual effect.

The problem is that meandering roadways also slow bicyclists; although their design speed is ordinarily at or above bicycle speeds, they do impose greater travel distances. The bicyclist's principal objection to them, however, is that as the road meanders, motorists often swerve across lanes, and even when they stay within a lane their precise path of travel is unpredictable. Since bicyclists must also meander, conflicts are likely. Bicyclists' opinions of Milvia Street are strongly divided for just this reason.

Chicanes

The word "chicane" is French, where it means quibbling or pettifoggery, but also means a zigzag trench or a baffle. Its most familiar English form is "chicanery." In traffic engineering it refers to a narrow, winding road, differing from a meandering roadway in that it is usually short, the turns are tight, and often it is wide enough only for one-way traffic. The roadway itself may be designed to meander, or the chicane can be created by bulbouts staggered on either side. Sight lines may also

be deliberately impaired. The Dutch woonerf is effectively a series of chicanes; chicanes are also popular in Seattle. Like meandering roadways, they tend to force motorists and bicyclists together.

Offset Intersections

One technique that has occasionally been used for traffic calming is to offset opposing legs of an intersection slightly, and to interrupt sight lines with shrubbery at the corners and on a small island. It seems unlikely that the increased safety resulting from slower speeds can compensate for the reduced safety resulting from interrupted sight lines. This technique is therefore not recommended.

STOP Signs

STOP signs are probably the most widely used of all residential traffic management measures. Their primary purpose is to assign right-of-way at an intersection, not to control traffic speed or volume, and there are official warrants for their installation. Nonetheless, they are frequently used to slow down or discourage through traffic. Many of these signs have been installed because of neighborhood demands rather than for engineering reasons.

Many residential neighborhoods whose streets are based on a grid pattern have a "guard and go" pattern of two-way STOP signs alternating every other block. A 1976 study in Palo Alto showed 85th percentile speeds ranging from 23 to 37 mph between STOP signs. Speeds were less than the 25 mph limit at only 3 out of 60 locations. This study found that over 70 percent of traffic failed to stop fully at intersections; speeds through intersections ranged from 2.5 to 10 mph. Speeds were reduced within about 200 feet of a STOP sign, but were evidently increased beyond the stop to compensate. The study concluded that speeds under this system were as fast as, or faster than, they would be without it. St. Paul, Minnesota, uses the same pattern of STOP signs (which it refers to as "basket weave"). It has been found effective in reducing right-angle collisions, but not speed or traffic volume.

Often neighborhoods have four-way STOP signs at every intersection. These more frequent stops would presumably be more effective in reducing midblock speeds, but drivers are even less conscientious about observing them (both because they are more frequent and because cross traffic must also stop). In addition, widespread use of four-way STOPs tends to make compliance more casual at the remaining two-way STOPs.

STOP signs are highly unpopular with bicyclists: they destroy momentum—which must be restored by the cyclist's muscle power—impose an unpredictable but occasionally long delay, and confer no right-of-way advantage. Cyclist compliance is often perfunctory or undetectable. There is no provision in California law for motorist-only STOP signs, although many cyclists would support a CAR STOP - BIKE YIELD interpretation, and indeed behave as if this were the law. Any changes to the law, would, of course, need to be made at the State level.

MEASURES THAT ARE INNOCUOUS TO BICYCLE-PRIORITY STREETS

The following measures have not proved to be very effective at traffic calming, yet do not pose any problems to bicyclists:

Warning Signs

These include standard black-on-yellow advisory signs such as "Children Playing," "Residential Street," or "Slow." Because these signs usually convey no information that is not already apparent, they are likely to have little effect. Other signs may display unconventional messages or odd speed limits intended to attract attention. Their effect, if any, is usually temporary.

Gateways

A gateway is an architectural feature, often a gate, pillar, or archway, designed to indicate entry into a special area, such as a residential neighborhood. A narrow gateway resembles curb extensions or a bottleneck, described earlier. If the gateway does not affect roadway geometry, its effect is likely to be similar to that of other warning signs.

Transverse Bands

These are lines painted perpendicular to the direction of travel at decreasing intervals, intended to create the illusion of increasing speed. They have occasionally been used in Europe at points where high-speed arterial traffic must slow down. The effect is probably slight and may decline with familiarity. There is no hazard to cyclists unless repeated applications of thermoplastic tape are allowed to build up.



APPENDIX F

BICYCLE PARKING, BUILDING AND TRANSIT ACCESS

Bicycle Theft in San Francisco

Bicycle Parking Requirements - Guidelines

DPT Bicycle Rack Placement Criteria

Guidelines for Bicycle Parking Requirements for New Construction

Seattle's Bike Parking Program

Indoor Bicycle Parking Examples

Proposed Bike Rack Styles

Locations for Bicycle Rack and Locker Placement



APPENDIX F1

Bicycle Theft in San Francisco⁽¹⁾

⁽¹⁾ *Bicycle Magazine*, August 1994.

B

icycle Bill whips a specially modified car jack out of his battered messenger bag and jams it onto a U-lock securing a Bridgestone mountain bike to a signpost in downtown San Francisco. Crouching over the bike like a vulture over a carcass, he winds the jack handle furiously. Seconds tick away. One, two, three, four, five...BAM!

The steel, brand-name lock has splintered like a chicken bone. It clatters to the sidewalk, worthless. Score another kill for Bicycle Bill, a San Francisco thief who claims to have ripped off 2,500 bikes in his 12-year career.

Bill moves on to a thumb-thick woven cable held by a padlock. He grabs a boltcutter he just bought for \$25 at a local hardware store. Its jaws slice through the lock's shackle like a razor through a vein.

"Locks are useless," boasts Bill, a tall, thin, 30ish guy who looks more like a yuppie dad than a bike thief who has done 5 years in the slammer. "They're a joke."

Bicycle Bill is just one germ in the bike-theft plague raging in the U.S. The FBI says 468,584 bicycles were reported stolen in 1992, the most recent year for which statistics are available. But bike-security specialists say most thefts go unreported and that the actual number is 3 to 10 times higher. Even if you accept the experts' conservative figure, that's still an average of nearly 4,000 bikes ripped off *every day*.

"This is a monumental problem," says Patrick Chorpenning of the American Center for Bicycle Registration.

But cyclists haven't gotten the message. It's estimated that more than half of all stolen bikes weren't even locked, and many others were locked improperly. In a '93 study of more than 500 BICYCLING subscribers, 76% said the biggest reason for not using a lock is that it's not necessary. No wonder Bicycle Bill is smiling.

It gets worse. In interviews with police, lock makers and veteran cyclists in cities from coast to coast, BICYCLING found that bike thieves are becoming more sophisticated, more organized, more daring, and more desperate. That means you've got to get smarter and more vigilant if you want to hang onto your bike. We'll show you how.

Our investigation also included meetings and interviews with the ultimate experts—thieves. We contacted them by running classified ads in 2 San Francisco alternative weekly newspapers, asking for "bike-theft experts to demonstrate and discuss tricks of the trade." That they did. One, Bicycle Bill, even agreed to do some real-life product testing by trying to break several locks we provided.

"Theft has changed," says Kash, who sounds like a bad guy because of his one-word name but isn't. He's a streetwise advocate for the San Francisco Bicycle Coalition. "We're seeing a whole new class of criminal who steals bicycles for a living. Now we're in trouble."

"If a thief wants your bike and has time, your bike is gone," adds Jesse Kalb of Transportation Alternatives, a New York City bike-advocacy group. "It's gotten out of hand."

One reason is simply that the mountain bike and fitness booms translate into more bicycles than ever on the street. More bikes mean more targets of opportunity. Second, for increasingly beleaguered police forces, bike theft remains a low priority. Third, bikes today are worth more. A canny crook can sell a \$3,000 titanium mountain bike for several hundred bucks, not bad for a few minutes of usually low-risk work.

"It's easy money," declares Razer, a 23-year-old bike thief known on the streets by his one-word graffiti tag. The Berkeley.

BREAK THIS LOCK

Who better to test locks than a bike thief? We asked Bicycle Bill to break 9 locks we provided, ranging from bargain-basement cables to state-of-the-art security devices. We locked a bike to a pole in downtown San Francisco and timed Bill as he attacked each lock with his favorite tools. Here are the results, along with some of his comments:



:11

1/2-inch-thick cable and hardened Master padlock (about \$27)

California, criminal says he can make \$100 for a half-hour's work. "The cops don't make a big deal out of it. I've been arrested with a stolen bike, put in jail, and when they let me out they gave me the bike to ride home on."

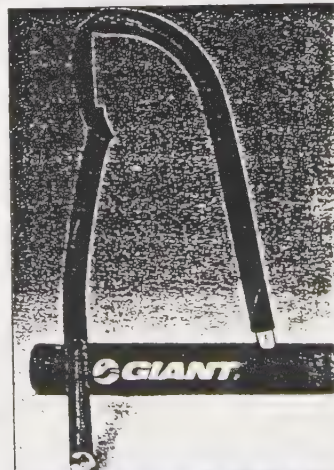
Bike advocates from Washington, D.C., to California report a rise in the number of bike-theft rings. These thieves cruise the streets in vans, armed with an arsenal of lock-breaking tools.

"They're in and out and back in the van in less than a minute," says Jeff Roth, a San Francisco bike cop.

Well-organized thieves strip the stolen bikes, remove or alter the serial numbers, repaint the frames, and sell them. Favorite customers include bike messengers and food-delivery people.

"It went like clockwork," recalls a thief who says in the late '80s he worked for a gang that stole bikes in L.A. "We worked Monday through Friday. We used to take the bikes we stole to a central point, a garage used for other stolen material—one time I saw a covered-up Jaguar in there. A guy would come in with a trailer at night and load up 20 bikes. God knows where he went or came from."

Some thieves steal components off bikes, perhaps filling customer orders for specific



:57

Taiwanese-made U-lock (\$28.95)



parts. "It's so easy to ride up to a bike and take the stem, bar, bar-ends and shifters," says Bicycle Bill. If the levers are Shimano's top-of-the-line XTR, he could sell the package for \$75 or \$100.

But overshadowing all this is the rise of crack cocaine, which has spawned a new generation of thieves who will do anything to make money for their next fix. Bikes are readily available, easy to steal and quickly convertible to cash—a crack-head's perfect revenue source. A bicycle is even a built-in getaway vehicle.

"Because of crack use, bicycles have become a means of exchange in major urban areas," says Michael Zane of Kryptonite, a leading U-lock maker (617/828-6655).

A crack addict probably has no idea what the bike is worth. He'll boost a \$1,000 locked bicycle from a crowded street corner at noon, then sell it for \$20 so he can get high.

"Are thieves more aggressive? Absolutely," says Erik Ott of Integrated Cycle Systems, maker of a U-lock accessory called Bad Bones (415/543-3787). "Are they doing it in broad daylight? Absolutely."

Lock makers have risen to the challenge by devising a variety of good products to thwart thieves. Kryptonite, for instance, has changed the design of its popular U-lock 6 times to keep ahead of lock-busting methods. Still, the company has uncovered 15 different techniques and thieves show no signs of slacking off. Now word on the street is there may be a new tactic, which we won't reveal except to say that it involves a product obtainable at any drugstore.

"It's a game of cat-and-mouse," says Razer. "In the ghetto we share secrets. Everybody's trying to make money."

Even more alarming is the emergence of bike-jacking. Several cases have been reported in Los Angeles, where thugs booby-trap bike paths with wires and broken glass, or whack passing riders with a baseball bat. These hoodlums know bikes and wait for cyclists on expensive ones.

"Four of us were riding on the San Gabriel Trail when three guys on mountain bikes chased one of us down to the river bottom," L.A. Wheelmen Bud Plochere recently told *The L.A. Times*. "They blocked the ramp and circled him, but he rode up the side of the bank and got away. It happens all the time. When you're alone or get separated from the group, it's dangerous."

Starting to feel nervous? Good. Complacency and apathy are a thief's most trusted accomplices. What he doesn't like are street-smart cyclists who know how to protect their mounts, which is why we asked bike-security experts, including thieves, to share their 10 best tips on stopping theft.

1. Prevention begins at home. "I'd very seldom get a bike off the street," says Bicycle Bill. "I was getting six or seven bikes a day going into the garage area of apartment complexes. I took 15 bikes out of a building one night. I kept a notebook on where bikes were. You wanted a Diamond Back? A Trek? I knew where they were. I had it down to such a science. It wasn't even a challenge."

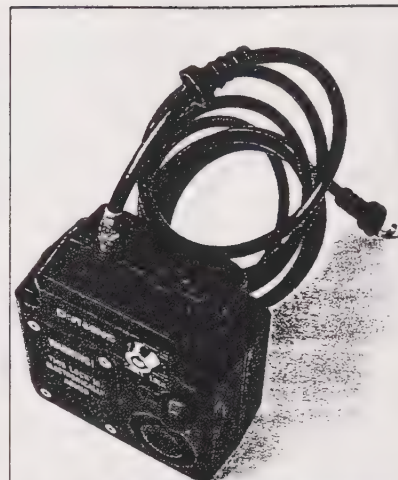
"In '92 I got a Merlin out of a fancy neighborhood. The guy was out there fartin' around with his car. He had the garage door open, and I looked inside."

The moral? Keep your bike in your living quarters, not a garage, basement, or storage locker where a thief can work undetected. Be especially wary of storerooms with mesh walls that give thieves a good look at the contents. You say the room has a door with a dead-bolt lock? Heed Bicycle Bill's tale about the time he struck pay dirt by removing a door's hinges.

2. Lock your bike. This holds if it's going to be out of reach—never mind out of sight—for any time at all. "I've done stakeouts where I've seen bikes stolen right out from underneath people," says Sean Collinsworth, team leader of the L.A. County Sheriff's bike-patrol unit.

Most cyclists prefer U-locks. Though heavier, larger and more expensive than a small cable and padlock, U's are generally more secure.

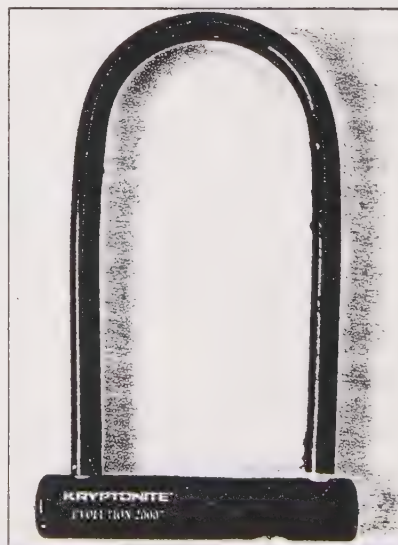
If you absolutely must leave your bike unlocked for a short time, ask a merchant or other dependable-looking person to watch it



1:55

Reon alarm lock (\$50)

"My [tools] are too big. Look, I pulled it out with my !@#Sing hand! What a piece of %^&*."



COULDN'T BREAK

Kryptonite Evolution 2000 U-lock (\$49-\$55)

"It won't bust. This is a good lock."



COULDN'T BREAK

ICS U-lock (about \$35) with 2 Bad Bones strips

going to notice or question some kneeling figure seemingly fumbling with a lock. But a thief working on one exposed bike is much more vulnerable.

4. Make your bike less attractive to thieves. If you regularly lock your machine for long periods, consider getting a beater bike for these times. "I have two bikes—one I'll lock up and one I won't because it's too valuable to ever leave alone," says Kalb of TA in New York.

Or copy the tactics of bike messengers, who uglify their steeds with tape, stickers, or homemade paint jobs. Avoid flashy parts like purple anodized chainrings, which scream, "I'm expensive. Steal me." And remember that thieves love mountain bikes because they're easiest to sell, so a nondescript road bike makes a less desirable target.

5. Lock your bike to something solid. Once Bicycle Bill found 2 bikes locked together by their top tubes. He removed the wheels from one bike, slid its frame onto the handlebar of the other bike, picked up the wheels, and rode away with 2 bikes.

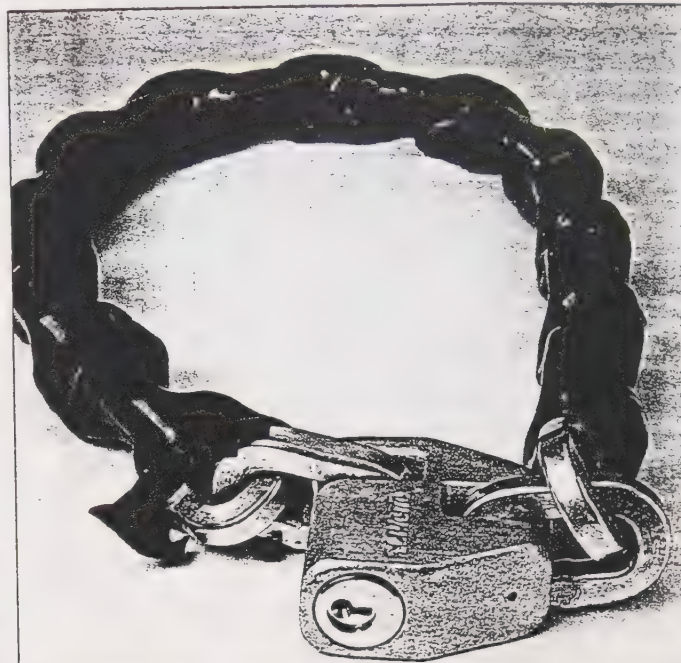
Lock your bike to itself and the thief will throw it in a van and break the lock at his leisure. Lock it to a small tree and he'll saw through the wood. Lock it to a signpost and he'll bend the post or remove the sign and lift the lock and bike over the top, maybe after loosening the sign's bolts earlier in the day to make the job quicker.

Veterans of the bike-theft wars choose well-anchored parking meters, permanently affixed bike racks, and other

for you. You can also sabotage a thief's getaway by moving the shift levers so the bike isn't in gear and undoing your front wheel's skewer and resting the fork blades on the edge of the axle.

3. Lock your bike safely. Find someplace that's crowded and well-lit so potential thieves are likely to be seen. Don't park your bike for more than an hour or so, especially in big cities and on college campuses, both notorious for bike theft. Never leave your bike out overnight.

And contrary to what you might think, says Razer, the Berkeley thief, it's safer to lock your bicycle alone than in a large bike-parking area. In a lot full of bikes, nobody's



COULDN'T BREAK

QuadraChain (\$100)

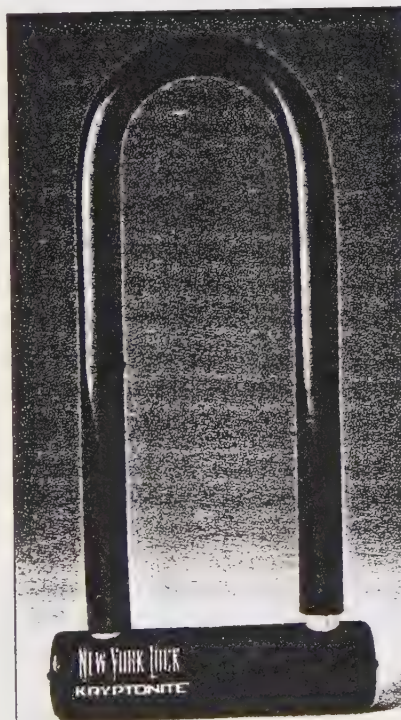
"I couldn't even scratch the surface. I'd buy this lock."

tamper-resistant objects. Kalb says savvy New Yorkers have begun locking their bikes head-high to scaffolding, making lock-breaking difficult and obvious.

6. Lock your bike correctly. "Seven out of ten people who use a Kryptonite use it improperly," says company CEO Zane. Lock both wheels and the frame to a secure object. Otherwise say goodbye to one or both wheels, especially if you have quick-release axles. If you use a cable or chain, be sure to run it through both rims and the frame. (Don't copy one of Bicycle Bill's victims, who secured her Cannondale to a parking meter by passing her lock through just one spoke, which he cut with a pair of pliers.) If you have a U-lock, remove the front wheel, place it next to the rear and pass the lock through both rims, frame, and the object. (See photo, opposite page.) Take with you anything easily stolen, like quick-release seatpost, pump, and cyclecomputer.

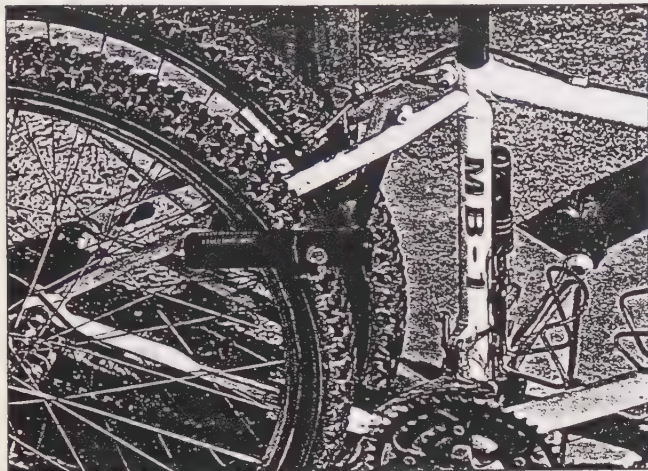
7. Lock your bike really correctly. "People have to understand that the window of opportunity is less than 10 seconds," says Ott of ICS. The idea is to make stealing your bike so difficult and time-consuming that thieves move on to easier prey. You're ahead of most people if all you do is use a lock. But if you want to be really safe, here are some advanced techniques:

- Use 2 different locks, so only thieves carrying 2 different tools can get your bike. Try combining a U-lock with a cable, chain, or Bad Bones.
- Don't let your lock rest near the ground, where the thief can smash it against the pavement with a hammer.
- Your U-lock is vulnerable to a prybar if it has a key mechanism at one end of the crossbar instead of in the middle. Point the mechanism toward the ground so it's harder for thieves to get at. To further protect the mechanism, cover it with a plumber's T or one of the accessories designed for this purpose.
- Don't leave enough space for thieves to insert tools into your U-lock. Use as small a U-lock as possible, fill the space with wheels and frame, or try ICS's Bad Bones, metal bands designed especially for this.
- If you live in a high-crime area, invest in a top-quality lock. In



COULDN'T BREAK

Kryptonite New York Lock (\$70-\$75)
"My [tool] won't fit in there."



Foil thieves by filling the lock's center.

New York City, the so-called bike-theft capital with more than 6,000 reported thefts in '92, cyclists have begun pairing a U-lock with the massive QuadraChain, a 6.5-pound, 3-foot-long, \$100, triple-heat-treated-steel monster (St. Pierre Manufacturing, 800/926-2342). And Kryptonite recently introduced its beefy New York Lock, which unlike other Krypto models is guaranteed in the Big Apple.

8. Register your bike. Though this probably won't keep your bike from getting stolen, it may help you get it back. Police store-rooms are full of recovered bikes, but you can't claim yours if you can't prove ownership. And even if you register your machine with local police, you may not be notified if it's recovered elsewhere. For a small fee, though, you can join a bike-registration organization that puts your bike into a national database accessible by police. Call the National Bike Registry (800/848-BIKE) or the American Center for

Bicycle Registration (800/347-6554).

9. Don't buy a stolen bike. Besides the fact that you can be charged with receiving stolen property, buying a boosted bike only supports the thieves. "When I come across a buyer, I arrest 'em in a heartbeat," says Collinsworth, the L.A. bike cop.

If the price seems too good to be true, the bike's hot. Also avoid buying a bike with a serial number that's been ground off, or one that's been altered (a common method is to use a hammer and punch to add a number at the beginning or end of the legitimate number). "And if you buy a bike on the street you can be reasonably sure you've bought a stolen bike," adds Kash of the San Francisco Bicycle Coalition. Other likely venues are flea markets and rock concerts.

10. Don't be a bike-jacking victim. This isn't a prevalent crime yet, but urban cyclists should learn what situations to avoid. "If a car passes you several times slowly, that's a hint to go to a public area, a store, or a police station," says Collinsworth. "Once you're reacting to immediate danger, it's too late."

Also be wary of strangers who stop you to ask for directions or a light. If you decide it's OK to stop, keep your eyes on them; don't point and turn away. And ride the other way if you see an unusual object like a park bench blocking a bike path. It could be an ambush.

"It's not paranoia," insists Collinsworth. "These people have a game plan. It's their business. They are predators."

Meantime, Bicycle Bill stands over a pile of mangled, shattered locks, having completed a demonstration of his craft. "Don't forget to tell people I'm a retired thief," he says, "and that I'm showing you this because I feel remorse."

"It takes more time for people to lock their bike than it does for me to break the lock," he says, stuffing the car jack and boltcutter back into his messenger bag. "I've broken a lot of people's hearts." ■

LET THE GOOD TIMES ROLL!

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LOW ROLLING RESISTANCE
FAST CORNERING



LAST YEAR'S MOST FAMOUS TIME TRIALS WERE ALL WON ON CONTINENTAL TIRES.

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*Results from the UCI World Championships, Norway

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FOR LOVE OF THE LAND, THE SPORT, AND VICTORY

The Choice of World Champions

Continental





APPENDIX F2

Bicycle Parking Requirements - Guidelines

BICYCLE PARKING REQUIREMENTS

Section 155 (j) of the San Francisco Planning Code requires that all new developments provide one bicycle parking space for each twenty off-street automobile parking spaces provided. Guidelines governing the types and locations of bicycle parking facilities which will satisfy that requirement are stated below.

1. Facilities

At locations where long term (8 hours or more) parking is expected to be the principal parking (e.g. business offices, hotels and motels, dwelling units, live/work units, group housing) at least one half of the required bicycle parking spaces should be in Class 1 facilities as defined in (a) below. The remaining spaces may be Class 2 facilities as defined in (b) below.

- (a) Class 1 Facilities. Class 1 facilities protect the entire bicycle, its components and accessories against theft and against inclement weather, including wind driven rain.

Examples of this type of facility include (1) lockers, (2) check-in facilities, (3) monitored parking, (4) restricted access parking, and (5) storage in a building where the bicycle is in the view of the bicycle owner.

Definitions:

- (1) A locker consists of a fully enclosed secure and burglar proof bicycle parking space accessible only to the owner or operator of the bicycle.
- (2) A check in facility is one in which the bicycle is delivered to and left with an attendant with provision for identifying the bicycle's owner. The stored bicycle is accessible only to the attendant.
- (3) Monitored parking provides Class 2 facilities within an area under constant surveillance by an attendant or security guard or by a monitored camera.
- (4) Restricted access parking provides Class 2 facilities within a locked room or locked enclosure accessible only to the owners of bicycles parked within.
- (5) At work sites or businesses, storage in a building within the view of the bicycle owner is storage at the bicyclist's work or customer location within the building.

Other facilities not listed above but providing an equivalent level of security may be approved by the Zoning Administrator.

- (b) Class 2 Facilities. Class 2 facilities are bicycle racks which meet the following standards:

- (1) Permits the locking of the bicycle frame and one wheel with a U-type bicycle lock.
- (2) Supports the bicycle in a stable position without damage to wheels, frame, or components. This excludes traditional type racks which support only one wheel.

2. Location

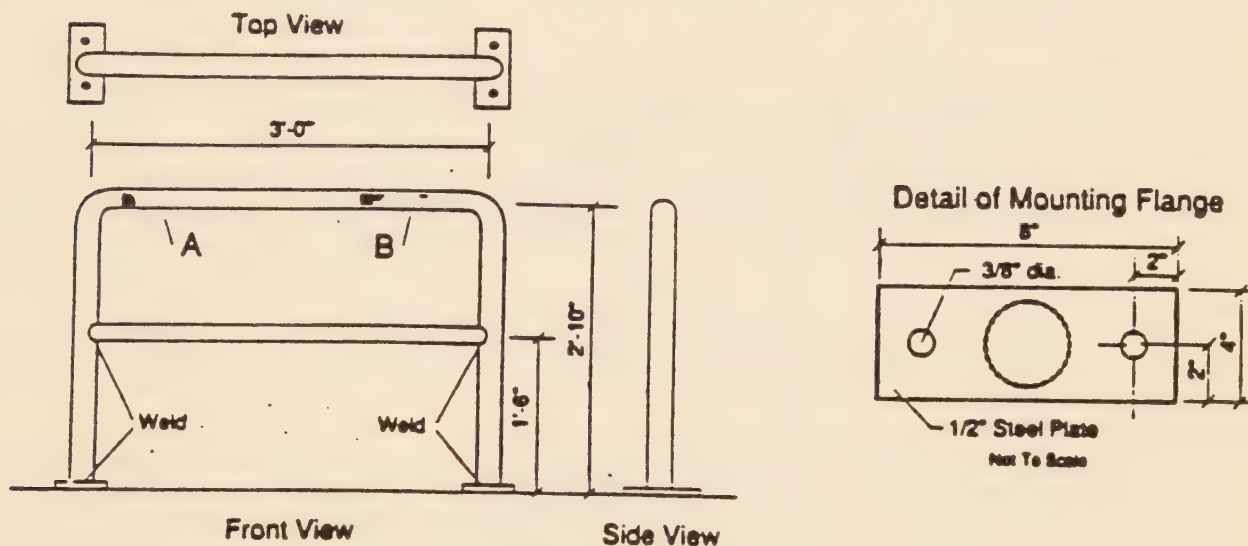
Placement of both Class 1 and Class 2 bicycle racks and other bicycle parking facilities, when applicable, should meet the following guidelines:

- (a) An aisle or other space to enter and leave the facility. The aisle shall provide a width of five feet to the front or rear of a standard six foot bicycle parked in the facility.
- (b) Each bicycle parking space shall provide an area at least 2 feet by 6 feet. Vertical clearance shall be at least 78 inches.
- (c) Bicycle parking should be placed at least as conveniently as the most convenient non-handicapped car parking. This will generally be close to the building entrance. If the bicycle parking is for long-term (i.e. all day or longer), the parking should be as convenient as the most convenient similar long-term non-handicapped automobile parking. Safe and convenient means of ingress and egress to bicycle parking facilities shall be provided by means of a lobby elevator (only if a suitable elevator is available) or other appropriate means.
- (d) Bicycle parking and automobile parking should be separated by a physical barrier or sufficient distance to protect parked bicycles from damage.
- (e) Class 2 bicycle racks should be located in highly visible areas to minimize theft and vandalism.
- (f) Where Class 2 bicycle parking areas are not clearly visible to approaching bicyclists, signs should indicate the locations of the facilities.
- (g) The surface need not be paved, but should be finished to avoid mud and dust.
- (h) All bicycle racks and lockers should be securely anchored to the ground or building structure.
- (i) The facilities shall not interfere with pedestrian circulation.
- (j) It is desirable that bicycles parked in Class 2 racks be protected from inclement weather, including wind driven rain. Such protection is required for Class 1 facilities.

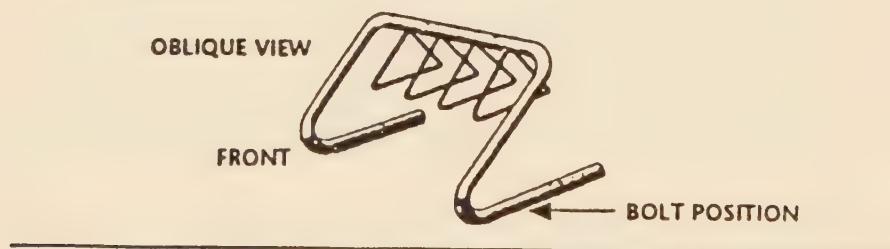
APPENDIX A

BICYCLE RACKS RECOMMENDED BY THE BICYCLE ADVISORY COMMITTEE

1. Rail-Type Racks



2. Hanging Triangle-Type Racks



3. Ribbon Racks



BICYPARK.REQ 17 July 1992



APPENDIX F3

DPT Bicycle Rack Placement Criteria

Division of Traffic Engineering

HANK M. JORDAN, Mayor
 JOHN E. NEWLIN, Executive Director

Bicycle Rack Placement Criteria

The intent of San Francisco's bicycle rack installation program is to encourage the use of bicycles for transportation by providing facilities to safely park bicycles in public places. In determining the appropriate placement of bicycle racks, the needs of all persons using the right of way will be considered.

Bicycle racks shall be installed in public spaces, generally on wide sidewalks, in line with existing street furniture and out of the path of travel to ensure that public streets, sidewalks and rights-of-way are not unreasonably obstructed.

Approval of bicycle rack installation will be determined by the width of the sidewalk and the level of existing and anticipated peak hour pedestrian volume. A minimum six foot width for a clear path of pedestrian travel, free of all obstacles, including bicycles parked at the rack, must be maintained on the sidewalk at all times. (Figures 1 and 2)

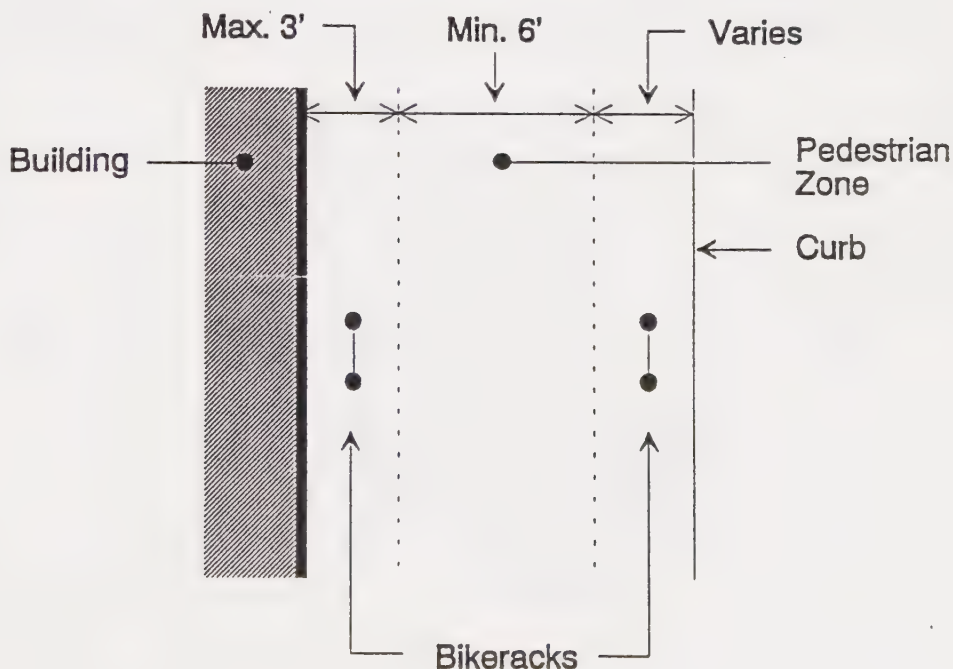
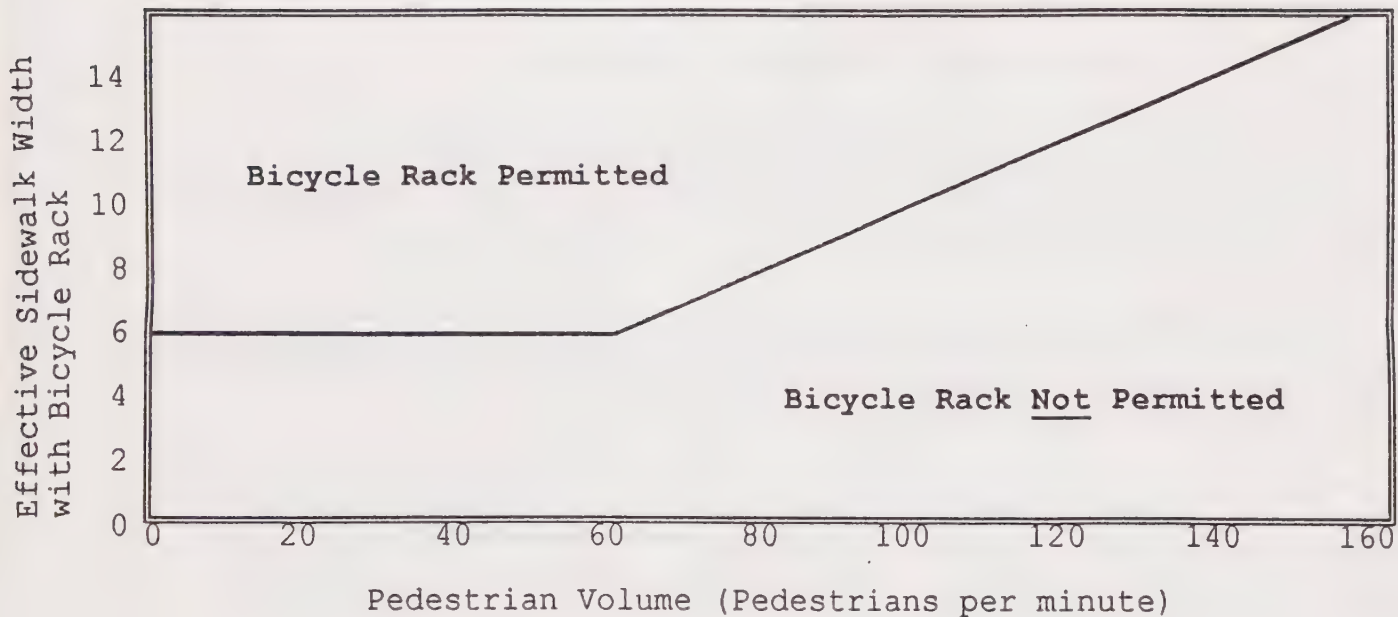


Figure 1 - Sidewalk Zones

Figure 2 - EFFECTIVE SIDEWALK WIDTH
(For L.O.S. C)



Bicycle racks and parked bicycles may not intrude on pedestrian corner clear zones. (Figure 3)

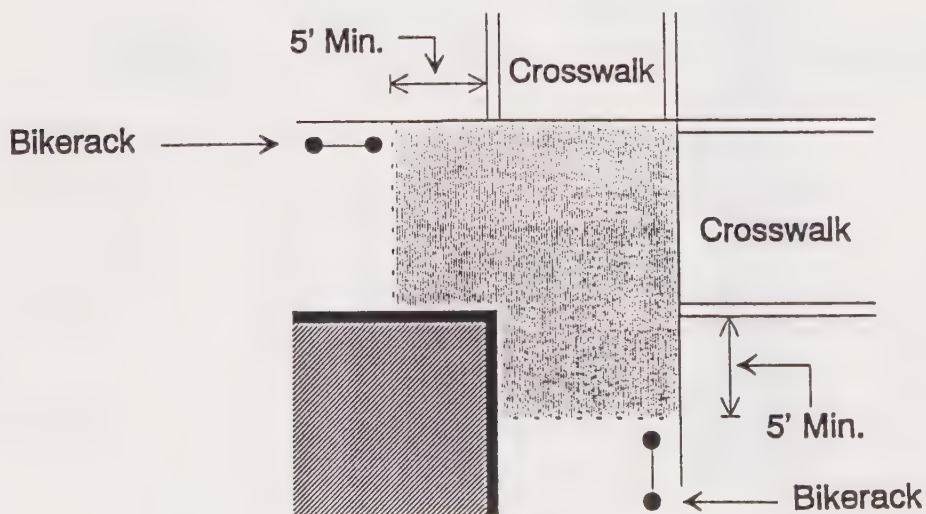


Figure 3 - Corner Clear Zones

Bicycle racks must be located in the sidewalk area fronting and within the applicant's property.

All bicycle rack installations must address accessibility and path of travel requirements for persons with disabilities based upon the California Building Code Title 24, Uniform Federal Access Standards, and the Americans with Disabilities Act.

Bicycle racks shall be installed in locations where neighborhood patterns of encroachment exist; or where no other street furniture exists, treatments (such as wing walls, planters, etc.) will be made to warn persons with visual disabilities of the presence of the bicycle rack.

No person may place, operate or maintain any bicycle rack on a public street, sidewalk or public-right-of-way where such installation, use or maintenance endangers the safety of persons or property, or unreasonably interferes with public utility, public transportation, or other public or government use, or unreasonably interferes with or impedes the flow of pedestrian, bicycle, wheelchair, or vehicular traffic, the ingress into or ingress from any residence, place or business, or any legally parked or stopped vehicles, or the use of traffic signs or signals, fire hydrants, police or fire call boxes or mailboxes, crosswalks, curb-ramps, driveways, utility poles, fire escapes, parking meters, underground utilities including sub-surface utility vaults, under-sidewalk basements, sidewalk elevators, delivery areas or loading zones, or any other structures.

No bicycle rack shall be placed within: any MUNI bus stop zone utilized for Golden Gate Transit, any MUNI nearside (immediately adjacent and prior to the intersection relative to the direction of travel) bus stop zone not utilized for Golden Gate Transit except for the last fifteen feet, any MUNI farside (immediately adjacent and after the intersection relative to the direction of travel) bus stop zone not utilized for Golden Gate Transit except for the last ten feet, ten feet of the front of any MUNI or BART subway entrance, or within five feet of any transit shelter.

There will be at least a two foot clearance between bicycles parked at racks and any other street furniture.

No bicycle rack shall be placed upon any portion of any street, roadway or other public-right-of-way on which motor vehicles are lawfully permitted.

The inverted "U" rail rack (Figure 4) and the ribbon rack (Figure 5) are preferred racks for normal sidewalk installation. They are unobtrusive, have no sharp edges or moving parts, and require minimal maintenance.



Figure 4 - Inverted "U" Rail Rack

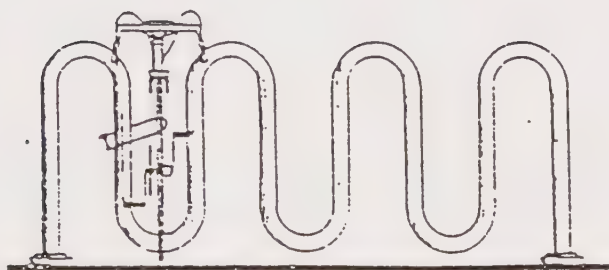


Figure 5 - Ribbon Rack

Application for bicycles rack installation shall be made in writing on a form provided by the City to the Department of Parking and Traffic (DPT). The application package shall inform the applicant of the requirements of this Bicycle Rack Placement Criteria. The applicant must submit a map or drawing showing the proposed location of the bicycle rack, with reference to measurements from the proposed location to street furniture, trees, planter strips, bus zones, transit shelters, property lines, curbs, structures and the like. Upon approval by DPT, bicycle rack installation will be contingent upon the issuance by the Department of Public Works of a Bicycle Rack Encroachment permit. If the application is disapproved in whole or in part, DPT shall notify the applicant promptly, explaining the reasons for denial.



APPENDIX F4

Guidelines for Bicycle Parking Requirements for New Construction

The League of American Bicyclists recommends the following bicycle parking requirements for cities with a five percent or better bicycle commuting rate:⁽²⁾

Land Use	Bicycle Parking Requirement
Multi-Family Residential <ul style="list-style-type: none"> ▶ General ▶ Primarily for students and low-income families ▶ Primarily for residents 62 or older 	1 Class 1 per unit, plus 1 Class 2 per 5 units. 1.5 Class 1 per unit, plus 1 Class 2 per 5 units. 1 Class 1 per 10 units, plus 1 Class 2 per 10 units.
Schools <ul style="list-style-type: none"> ▶ Elementary, middle school, high school 	1 Class 1 per 10 employees, plus 1 spot per 4 students. (50 percent Class 1, 50 percent Class 2.)
Colleges <ul style="list-style-type: none"> ▶ Student residences ▶ Academic buildings and other facilities 	1 Class 1 per 1.5 beds, plus 1 Class 1 per 10 employees. 1 Class 1 per 10 employees, plus 1 spot per 3 student seats. (25 percent Class 1, 75 percent Class 2.)
Parking Garages and Park-and-Ride Lots	20 percent of auto parking. (75 percent Class 1, 25 percent Class 2.)
Transit Centers	15 percent of daily boardings. (75 percent Class 1, 25 percent Class 2.)
Park-and-Ride Lots and Transit Centers	35 percent of required automobile spaces.
Cultural and Recreational (includes libraries, theaters, museums, religious institutions)	1 Class 1 per 10 employees, plus 1 Class 2 per 500 sq. ft. or 20 seats (whichever is greater).
Park and Recreational Fields	1 Class 1 per 10 employees, plus 1 Class 2 per 3 users during daylight times at peak season.
Retail Sales, Shopping Centers, Financial Institutions, Supermarkets	1 Class 1 per 10 employees, plus 1 Class 2 per 2,000 sq. ft.
Offices and Office Buildings	1 per 2,000 sq. ft. (75 percent Class 1, 25 percent Class 2).
Hotels, Motels, Bed and Breakfasts	1 Class 1 per 10 rooms, plus 1 Class 1 per 10 employees.
Hospitals	1 Class 1 per 10 employees, plus 1 Class 2 per 15 beds.
Restaurants	1 Class 1 per 10 employees, plus 1 Class 2 per 1,000 sq. ft.
Industrial	1 Class 1 per 10 employees or 5,000 sq. ft. (whichever is greater), plus 1 Class 2 per 5,000 sq. ft.
Day Care Facilities	1 Class 1 per 10 employees, plus 1 Class 2 per 25 students.
Auto-Oriented Services	1 Class 1 per 10 employees.
Other Uses	Same as most similar use listed.

⁽²⁾ Cities like San Francisco whose bike commute rate is less than two percent should divide these recommendations by 3.

"Employees" means the maximum number of employees on duty at any one time. The minimum number of spaces required is 4, unless the above standards would require 1 or less, in which case the minimum is 2.

The City of Davis imposes the following requirements for bicycle parking:

Land Use	Bicycle Parking Requirement
Multi-Family Residential	Two spaces per dwelling unit.
Commercial	30 percent of required automobile spaces.
Municipal Offices, Parks, Swimming Pools, Museums, and Auditoriums	30 percent of required automobile spaces.
Places of Employment	One space for every two employees during the heaviest shift.

The City of Santa Cruz's requirements for any new building, addition to or enlargement of an existing building, or change in occupancy of a new building that results in the need for additional auto parking, are:

Land Use	Bicycle Parking Requirement
Commercial, Industrial, Office, Retail, Service	Two plus 15 percent of required automobile spaces.
Multi-Family Residential (three or more unit)	One space per unit.
Public or Commercial Recreation	35 percent of required automobile spaces.
Schools	One space for every three students.
Park-and-Ride Lots and Transit Centers	35 percent of required automobile spaces.
Lodging	One space per five units.

Fractions over 0.5 are rounded up. Spaces are divided between Class 1 and 2 according to the following table:

Land Use	Class 1	Class 2
Commercial, Industrial, Office, Financial	60 percent	40 percent
Rail, Service	20 percent	80 percent
Multi-Family Residential (three or more units)	100 percent (garages or secure accessible indoor areas)	--
Public or Commercial Recreation	10 percent	90 percent
Schools	--	100 percent (secure and covered)
Park-and-Ride Lots	80 percent	20 percent
Transit Centers	--	100 percent (secure and covered)



APPENDIX F5

Seattle Bicycle Parking Program

Bike racks

The Seattle Engineering Department's (SED) Bicycle Spot Improvement Program installs bicycle racks in neighborhood business districts to encourage bicycling for short trips and errands. The racks provide safe and convenient bicycle parking.

Rack Installation

Racks are installed at the request of property owners, business owners, or citizens. Bicycle Program staff meet with representatives from interested businesses to explain the program, answer questions and select a location for the rack. The racks remain the property of SED. SED assumes responsibility for the rack but not for bikes parked at it.

Rack Location Criteria

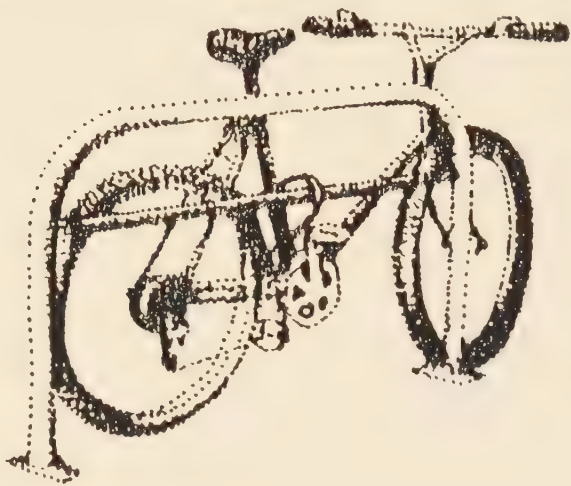
Several criteria are used in siting the racks:

- Racks are installed in public space, usually on a wide sidewalk with five or more feet of clear sidewalk space remaining.
- Racks are placed to avoid conflicts with pedestrians. They are usually installed near the curb and away from building entrances and crosswalks.
- Racks can be installed in bus stops or loading zones only if they do not interfere with boarding or loading patterns and there are no alternative sites.

Installation on

Private Property

Racks on private property are usually paid for by the property owner. Bicycle Program staff can help property owners choose appropriate racks and locations.



Type of Rack

The Bicycle Program has selected a rack that it prefers to install. It is a railing type rack, made of 2" galvanized pipe, 54 inches long, 32 inches high, and holds two bikes. The rack is unobtrusive, aesthetically pleasing, has no sharp edges or moving parts, and requires little maintenance. If you notice a rack has become loose or damaged please let us know.

How to Get a Rack

Fill out the request form and mail it to us. For more information about the Bike Rack Program call the SED Bicycle Program at 684-7584.

BICYCLE RACK REQUEST

City of Seattle
Bicycle Program

We need your help to put bike racks where you want them. We install racks in neighborhood business districts, where bicyclists going to various places can park. We can also help bigger or isolated businesses choose a rack and find a good place for it. Let us know where you'd like a rack, and who to talk to there.

Proposed Bike Rack Location:

Business: _____

Address: _____

Zip: _____

Owner or Manager: _____

Day Phone: _____

Other Comments: _____

Date _____

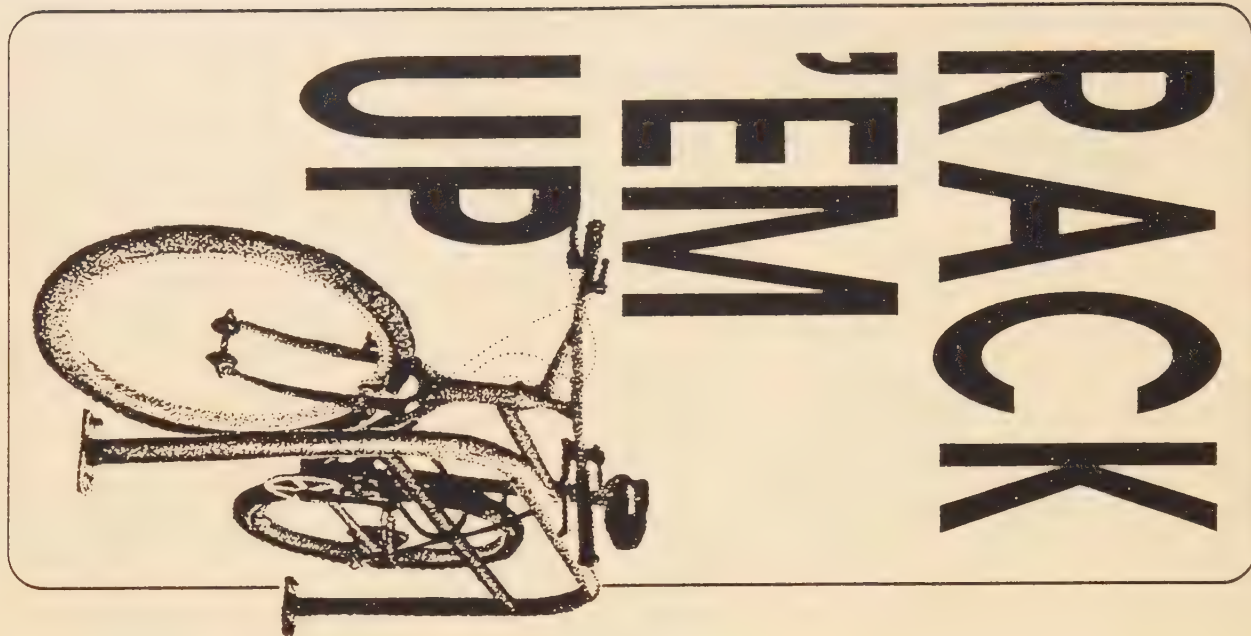
Your Name: _____

Day Phone: _____

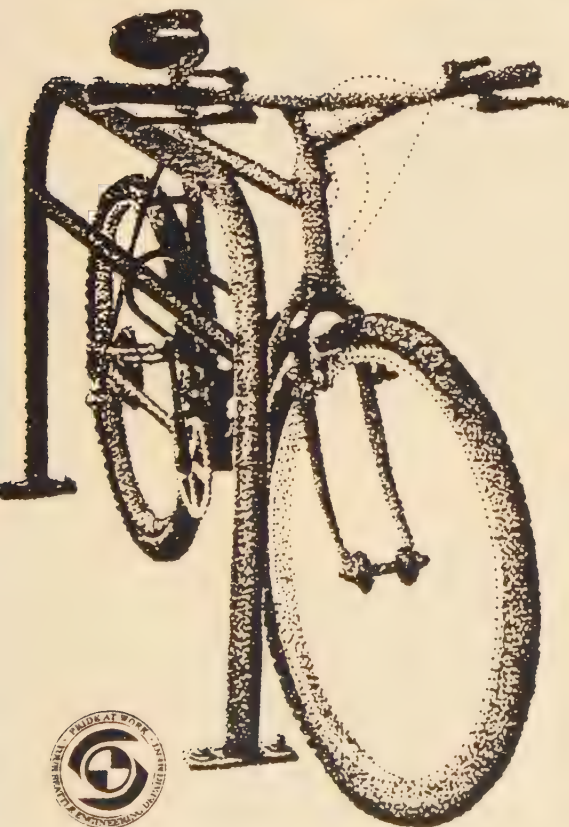
Address: _____

Zip: _____

For further information contact: Seattle Engineering Dept., Bicycle Program, 684-7584
Send this request to: Seattle Engineering Dept., Bicycle Program, 708 Municipal Building,
Seattle, Washington 98104



Bicycle rack coming to the sidewalk in front of you.



X marks the spot.

This is where a free bicycle rack
will be installed on the sidewalk
in front of your address.

Installation will occur in 2 - 8 weeks.



If there is a problem with this installation in front of your address,
please check the box below and fill in the information below and
send this to us.

☐ Please **do not** install a bike rack in front of our address.

Business: _____

Address: _____ Zip _____

Owner or Manager: _____ Phone _____

Other comments: Reason

For further information contact the Seattle Engineering Department Bicycle Program at 684-7584.





Seattle Engineering Department *News Release*

July 27, 1993

Contact: John Arnesen, Bicycle Program, 684-7584
Mike Alvarado, Public Information, 684-5711

City to Install Bike Racks

Beginning in late September, the Seattle Engineering Department will install approximately 900 bicycle racks throughout the city.

Currently, the department's Bicycle Spot Improvement Program provides free installation of racks upon request of business and property owners. With the recent infusion of 80 percent matching funds from the federal government, the City begins a more "systematic" approach to making bicycling more attractive as an alternative to travelling by car.

Every business district in the City will receive new bike racks. We are looking for businesses, property owners and residents to come forward with their suggestions for where the racks should be located.

The main goal is to encourage people to travel by bike instead of car. The program is designed to serve short-term trips, like shopping, as compared to commute, or long-term, trips. Attitude surveys indicate parking availability is a significant factor people consider when deciding how they will travel. The unobtrusive, no-maintenance racks help meet this need.

A secondary goal of the program is to help increase business in neighborhood and downtown areas.

Approximately \$270,000 is budgeted for purchase and installation of bike racks, with another \$330,000 earmarked for other improvements to make bicycling an attractive travel option. Additional projects will include striping bike lanes; improving roadway surfaces, especially at railroad crossings; new signs; and biker-friendly storm grates.

Engineering Department crews will take approximately five months to complete rack installation.

To request a rack, call the City's Bicycle Program at 684-5374, or for more information, call 684-7584.

Bike Rack Location Guidelines for Systematic Placement

Systematic Bike Rack placement will occur in the downtown area, business districts and along arterials throughout the city. Racks will be installed where we see a need (i.e. bikes are locked up in the area) and where there are retail type businesses that generate bicycle parking needs.

The following is a breakdown of the general types of districts and the planned number of installations.

1. Downtown (busy retail areas)

- Along the avenues - 3 racks per block face , near building entrances, generally at each end and one in the middle.
- Along the side streets - 2 racks per block face if there are businesses or building entrances.

2. Neighborhood Commercial Areas (Broadway, University Dist, Alaska Junction, etc.)

- Along the main street - 3 racks per block face , near building entrances, generally at each end and one in the middle.
- Along the side streets - 1 rack if there are entrances for businesses.

3. Strip Development (Aurora Ave, Greenwood Ave, Rainier Ave, etc.)

- Install racks where there are retail businesses fronting the sidewalk - Maximum 3 racks per block

4. Along Arterials

- Install racks as needed where retail businesses fronting the sidewalk exist.

General Information.

1. Where you see bikes locked up already this may be a good location for a Cora Bike Rack.
2. Where a rack installation will require concrete pad installation make a note, we will install these next year.
3. Where off street parking separates the businesses from sidewalk do not install racks.
4. Be flexible. If conditions warrant, install four racks instead of three on a block face. In some cases, only one or two racks may be needed.
5. Be liberal. When in doubt, install the rack. We want to promote bicycling.
6. Don't push. If an adjacent property owner does not want a rack for any reason, don't install one. We have lots of locations where the racks will be welcome.

3. CHOOSING A SITE: PREFERRED LOCATIONS AND RECOMMENDED PRACTICES

Naturally you'll want to locate your parking closest and most convenient to the location you wish to serve. With that in mind, here are some situations to look for and some principles to consider.

- Sidewalks are often very busy. You may be able to locate your parking off the sidewalk, while offering public visual and physical access from the walkway to increase security and use of the parking area. You should consider using an off-walkway sidewalk bay (usually privately owned) or constructing an on-street bike parking bay (usually space used for auto parking).
- You should minimize encroachment on the walkway by matching fixtures which already define the edges of the walkway and by siting racks as close to the street as allowed.
- Interference with walking can be reduced by clustering parked bicycles within the shadow areas of fixed objects. Diverters such as bollards or waste containers can be placed within the pedestrian approach paths to bicycles, to guide walkers and people using canes around them.
- Established pedestrian paths associated with such sidewalk activities and features as crosswalks, transit shelters, wheel chair ramps, doorways and vehicle loading zones should be maintained by keeping bicycles outside of these alignments. Foot access to motor vehicles for transfer of goods and passengers can be preserved by placing bike racks at the inactive ends of various curb zones, to minimize impacts on individual parking stalls.
- Existing roofs and walls may be utilized for sheltering bike parking from rain and sun, if they are not needed for activities such as window shopping or waiting for buses.
- If you are considering customer/client bike parking on an area-wide basis, try to locate your parking sites near specific or combined business activities. Their nature and activity levels will determine the degree to which the racks are used. Racks located near corners, for instance, often feature more activities and uses within a shorter walking distance and offer greater visibility -- hence security -- than mid-block sites.

4. PERMITTED BICYCLE RACK SITES ON PUBLIC RIGHT-OF-WAYS (See Section 5 for clearance requirements for these sites. See the Definitions Section for description of key terms used.)

Look for these opportunities in the order noted here, in check-list fashion.

1) Unused architectural bays on the back side of the walkway.

These should allow visual and physical access from the sidewalk; they are usually privately owned and outside of the street right-of-way.

2) Protected street surface bay.

This space may be difficult to utilize because it is used for auto travel, parking or standing. You may have to obtain the support of the neighborhood to change its use. You might also have to install special diverters to protect the bicycles, or agree to remove debris from areas which cannot be cleaned with City street sweeping equipment.

3) Front side of walkway.

- a. Next to No Parking or Tow-Away zones which are not adjacent to vehicle travel lanes. (Zones abutting other parking or loading zones and hence set back from street vehicle travel lanes.)
- b. Next to Truck Load zone, at head only.
- c. Next to Passenger Load zone, at head or approach only.
- d. Next to Bus zone, at foot, or preferably within inactive approach with no adjacent curb coverage by standing bus, and when pedestrian uses are not significant.
- e. Next to No Parking or Tow-Away zone which is adjacent to vehicular travel lane.
- f. Next to metered parallel auto parking zone at approach, exit and mid-bumper sites without meters only.
- g. Next to unmetered parallel auto parking zone at approach, exit, and approximate mid-bumper sites. (Marking of auto parking stalls is especially desirable without meters, to define consistent mid-bumper sites.)
- h. At curbside head or foot of diagonal auto parking on approximate auto centers, preferably with bikes placed parallel to auto alignment.

4) Building wall face at back side of walkway.

5. REQUIREMENTS FOR BICYCLE RACKS ON PUBLIC RIGHT-OF-WAYS.

YOU MUST OBTAIN A STREET USE PERMIT IF YOU INSTALL A BIKE RACK ANYWHERE ON A PUBLIC RIGHT-OF-WAY.

Using these guidelines will help speed the permit process, which is intended to protect public places from disorderly use and to maintain safety.

For more information on permits and permit fees contact:

Seattle Engineering Department, Street Use Division, 5th Floor, Municipal Building, Seattle, WA 98104, 625-2317.

IF YOU PROVIDE A BICYCLE RACK FOR THE CITY BICYCLE PROGRAM TO INSTALL YOU MAY NOT HAVE TO OBTAIN A PERMIT. SUCH A RACK MUST BE FOR CONVENIENT USE BY THE PUBLIC AND YOU MAY HAVE TO MAINTAIN IT AND/OR MEET CERTAIN DESIGN REQUIREMENTS.

For more information on having a rack installed by the City, contact:

Seattle Engineering Department, Bicycle Program, Office for Planning, Rm. 612, Municipal Building, Seattle, WA 98104, 625-5177.

MINIMUM SET-BACKS AND CLEARANCES FROM OTHER STREET FEATURES

A. Curb Face Set-Back

1. Adjacent vehicle travel lane (peak period or continuous)
 - a. Nonarterial street rack placement, or bike rack designed for locking and loading on back (sidewalk) side of rack, 1.5' or placed to match existing fixture setbacks, whichever is greater.
 - b. Bike rack placement on arterial street with design intended or likely to encourage cyclist to stand on or walk around front (street) side of rack when loading or locking bike, 3'.
2. Adjacent No Parking or No Standing zone, setback from vehicle travel lane (abutting other parking or standing zones along curb), 1.5' or placed to match existing fixture setbacks, whichever is greater.
3. Adjacent parallel parking, 2.5'.
4. Adjacent diagonal parking, head-in, 3.5'.
5. Adjacent diagonal parking, head-out, 4.5'.

B. Crosswalk (marked or legal unmarked), 4'.

C. Wheelchair ramp (center tread panel), 7'.

D. Fire Hydrant, 5' to front and side hose fittings and 3' to rear; or 4' radius around hydrant.

E. Utility Pole, 1'.

F. Fire Standpipe, 3' radius from hose fittings or 6' wide access corridor when set back from walkway.

G. Street Tree, 1.5' from trunk, or 1.5' from planting in tree pit.

H. Diagonal Parking, Parking Meter, 3' from side parallel to auto stall.

I. Driveway or Alley

1. Arterial and business district commercial street, 5'.
2. Residential access street, 3'.

J. Walkway Width and Clearance

1. Main arterial and business district commercial street sidewalks
 - a. Desirable, 8'.
 - b. Permissible when placed to match existing fixture setbacks and in areas with narrow walkway character, 6'.
2. Residential access street and collector arterial sidewalks, maintain 5' walkway width.

MAXIMUM CURB FACE COVERAGE (Lineal distance along curb)

- K. Bus zone foot (from rear bumper of rear coach, at peak queue length, including coverage with other sidewalk fixtures), 12'.
- L. Truck Load Zone Head, 6'.
- M. Passenger Load Zone Head, 6'.
- N. Metered Parallel Auto Parking Zone
 1. Zone approach or exit, 12'.
 2. Active stall (marked or within 18' from meter), 5'.
- O. Unmetered Parallel Auto Parking, as above, but based on estimated auto parking coverage using 18' nominal auto size with 6' maneuvering space.

PEDESTRIAN DIVERTER REQUIREMENTS

- P. For bicycle parking arrangements which are located along or protrude within the back side portion of a walkway which is less than 12' wide, the placement of diverters, such as planters or waste receptacles, is required at both ends of the bicycle protrusion into the walkway. Such diverters guide pedestrians around the bicycles and provide an object for ready detection by people using canes.

When sheltering bikes parked parallel to a wall face, such a diverter should protrude at least 2' from the wall face and may protrude farther into the walkway if the walkway width requirements noted in J. above are maintained.

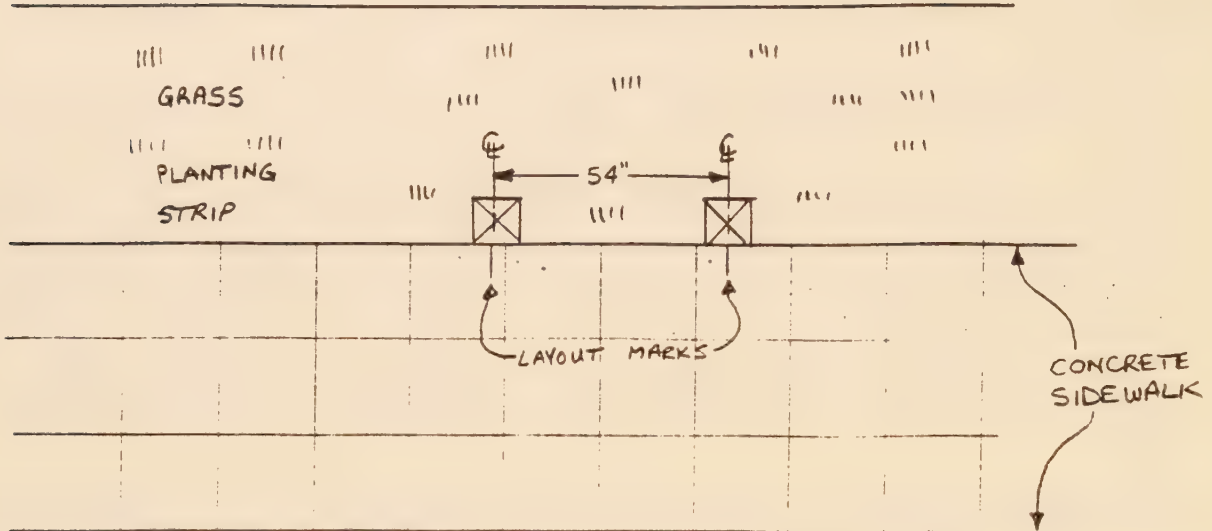
DEFINITIONS (see illustration, by letter)

- a. Sidewalk - broadly defined to include the area between the curb face and the building line at the back of the sidewalk.
- b. Walkway - the area of a sidewalk normally used for walking at peak periods. An area defined by both fixtures and textures; including other moving pedestrians and surface discontinuities such as tree pit gratings or a pavement edge. The width and nature of this area are quite variable. Walkways typically include 8" to 18" wide shy zones along each edge. These may not comprise the normal walking tread but are utilized as a comfort zone between walkers and protruding objects, doorway exit movements, for swinging arms or parcels, waiting or window shopping or as a cane search area for people with visual impairment.
- c. Front side of walkway - the portion of the sidewalk between the main walkway tread surface and the street curb face.
- d. Back side of walkway - the portion of the sidewalk between or at the building or property line and the main walkway tread surface.
- e. Sidewalk bay - an area between the back of a walkway and an inset building line. May not receive significant foot travel due to relatively short length. Often used for window shopping or other pedestrian activities, which may preclude bike parking.
- f. Street bay - an area on the street surface between the street curb and a street travel lane, which is sheltered from vehicle access by a curb or diverter.
- g. Head of vehicle stall - the portion of a marked or defacto vehicle stall accommodating the front of the vehicle.
- h. Foot of vehicle stall - the portion of a marked or defacto vehicle stall, accommodating the rear of the vehicle.
- i. Exit of curb zone - the end or transitional area of a designated curb zone used for vehicle exit but not for adjacent parking or standing.
- k. Lateral walkway - a pedestrian walkway entering a main street sidewalk walkway from the side, more or less at a perpendicular angle.
- l. Crosswalk - as marked on the pavement or the portion of the roadway between the intersection area and the prolongation or connection of the farthest sidewalk line.

TYPICAL CONCRETE PAD INSTALLATION IN GRASS AREAS

NO SCALE

JAA
12/3/93



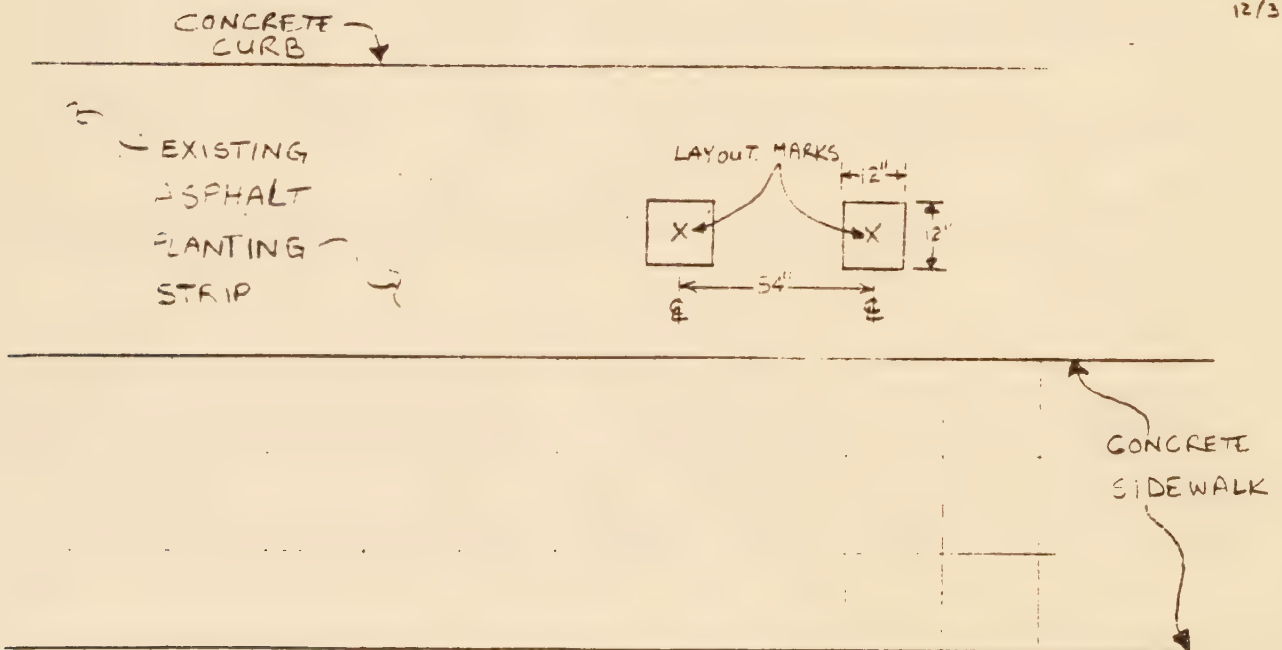
Notes for Grass Areas:

1. Concrete Pads shall be 12" x 12" in size.
2. Concrete Pads shall be 54" from center to center, and placed adjacent to sidewalk unless indicated otherwise on the Work Instruction
3. Concrete Pads shall be 16"-18" in thickness
4. Use caution to avoid damage to utilities, sprinklers etc.

TYPICAL CONCRETE PAD INSTALLATION IN ASPHALT AREAS

NO SCALE

JAA
12/3/93



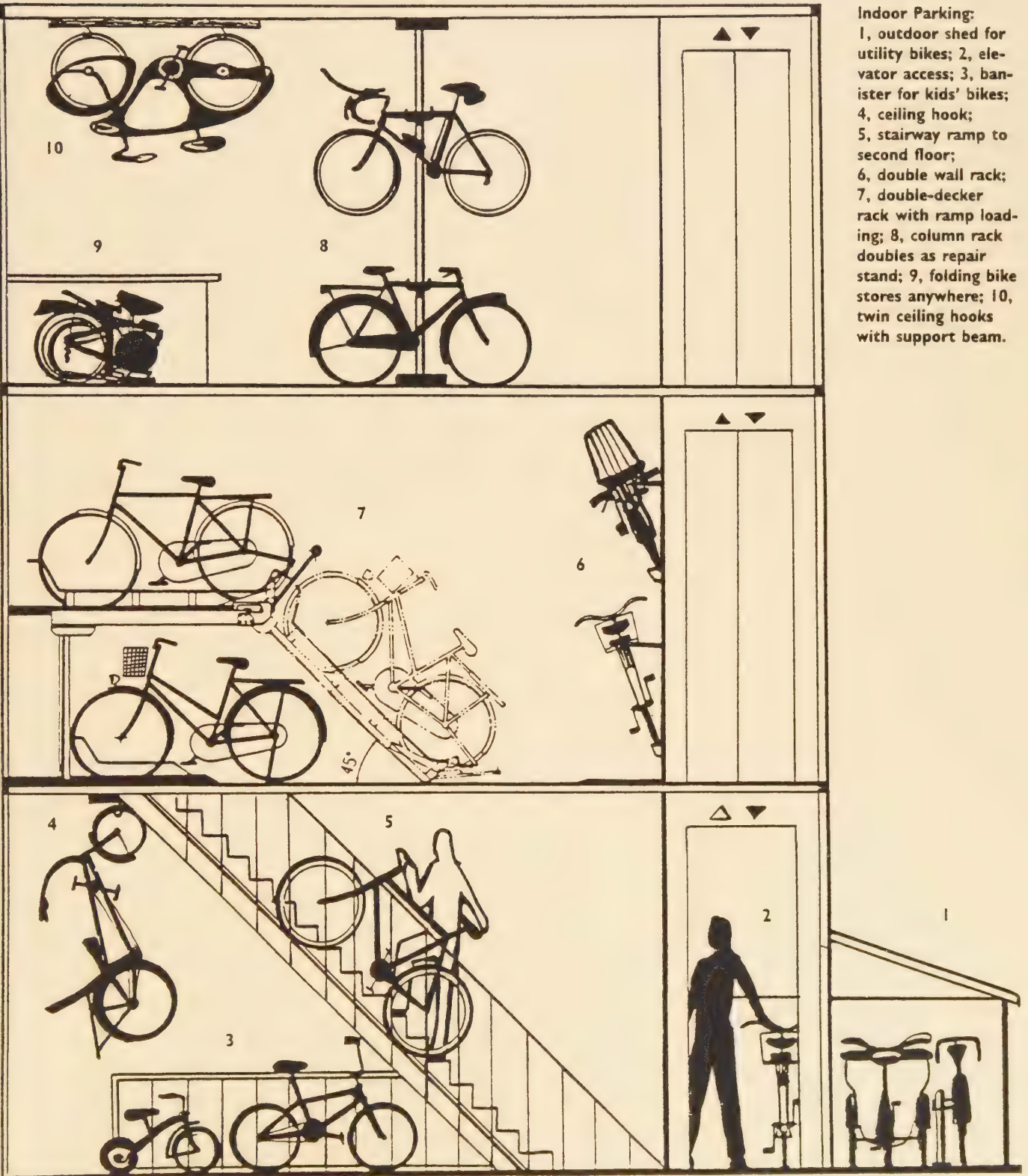
Notes for Asphalt Areas:

1. Concrete Pads shall be 12" x 12" in size unless layout indicates otherwise
2. Concrete Pads shall be 54" from center to center
3. Concrete Pads shall be 6" in thickness
4. Use caution to avoid damage to utilities, etc.



APPENDIX F6

Indoor Bicycle Parking Examples



Indoor Parking:
 1, outdoor shed for utility bikes; 2, elevator access; 3, banister for kids' bikes; 4, ceiling hook; 5, stairway ramp to second floor; 6, double wall rack; 7, double-decker rack with ramp loading; 8, column rack doubles as repair stand; 9, folding bike stores anywhere; 10, twin ceiling hooks with support beam.



APPENDIX F7

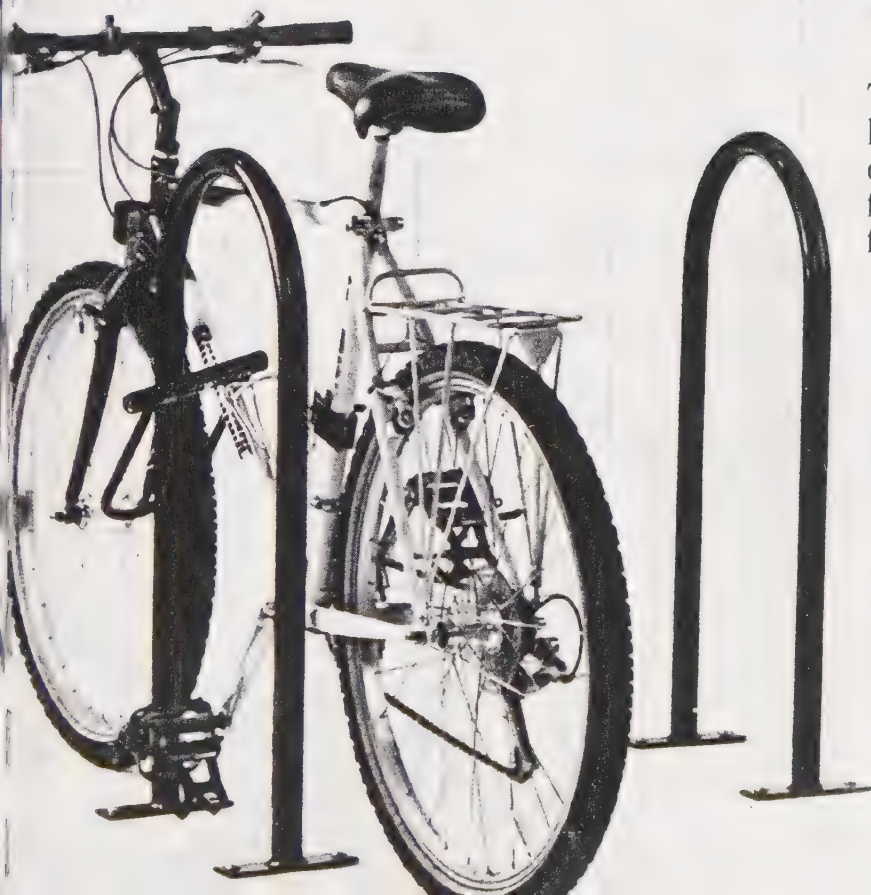
Proposed Bike Rack Styles

A Cycle-Logical Choice.



The Bike Rib®

The Bike Rib®'s user-friendly design allows easy lock-up of bike frame and wheels- AND promotes organized and efficient bike parking. The Bike Rib® fits where other racks won't and provides optimum flexibility in site orientation.



Making Bike Racks
That Work.

The Bike Rib® SPECIFICATIONS

FINISH OPTIONS

• Galvanized:

The racks are fabricated using galvanized Schedule 40 Pipe, ASTM 53A.

• Powder Coat Paint:

A polyester powder coat is applied to galvanized pipe. Galvanized pipe is used as substrate to protect against rusting if paint scratching occurs.

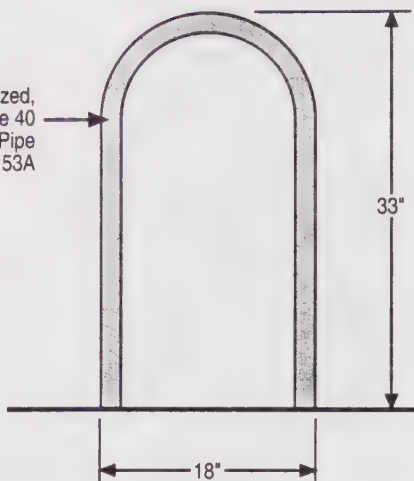
• Vinyl-Like Powdercoat:

A "kind to bikes" (soft to touch) thermoplastic coating applied to galvanized pipe provides excellent resistance to acids, weather, and abrasion.

• Stainless Steel:

A 1 1/2", T. 304 stainless, .083" wall/14 gauge tubing with #4 (brushed) to #7 (polished) finish is available.

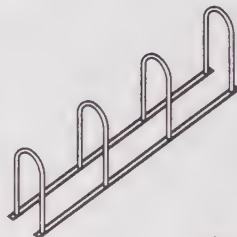
1.25" Galvanized,
Schedule 40
Steel Pipe
ASTM 53A



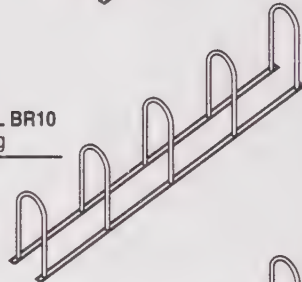
MODEL BR6
48" long



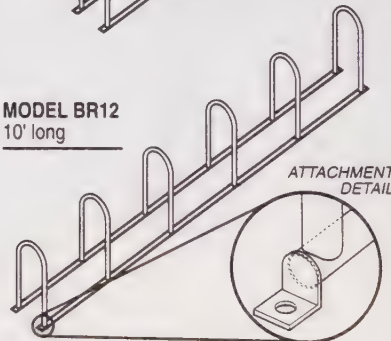
MODEL BR8
72" long



MODEL BR10
96" long



MODEL BR12
10' long



MOUNTING OPTIONS



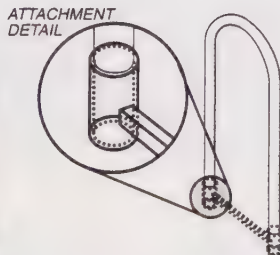
SURFACE MOUNT

MODEL BR2-1
Rectangle Base Plate
(6" x 2" x 3/16")

Drill four 1/2" d. holes approx. 2" deep, then insert anchors and attach rack with bolt (bolts and anchors included).



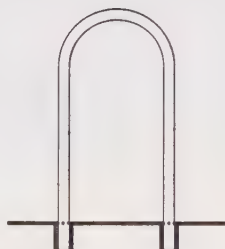
MODEL BR2-2
Round Base Plate
(6" x 3/16")



INGROUND MOUNT

MODEL BR2-3
(Imbedded)

Bike Rib® drops into sleeves imbedded in concrete, and is anchored with epoxy.



MODEL BR2-4
(Inground)

The rack is left long to accommodate core drill or below grade installation (4"-12").

GROUPING OPTIONS

The Bike Rib® Bike Rack

is a series of Bike Rib®s connected to bottom rails spaced 24" on center. Model numbers correspond to the number of bikes each rack holds. See Attachment Detail and Surface Mount instructions.

COMPANY PHILOSOPHY

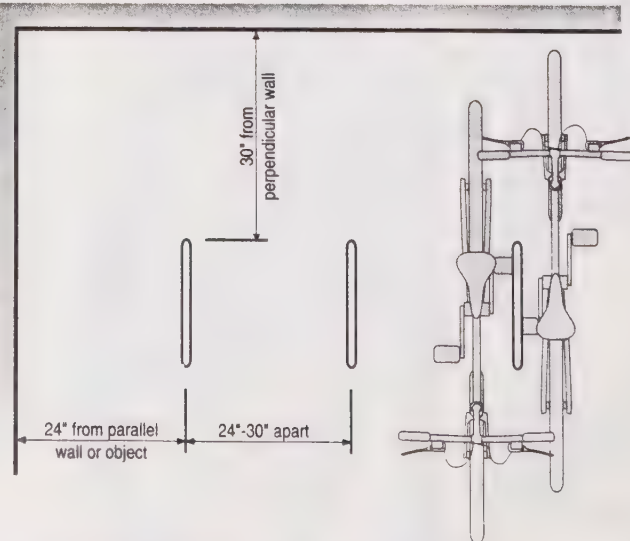
Function First Bike Security was established to encourage bicycle use as a transportation alternative to automobiles. Our goal is to provide products that support cycling.



Function First Bike Security
P.O. Box 44137
Tucson, AZ 85733-4137
(602) 322-9626

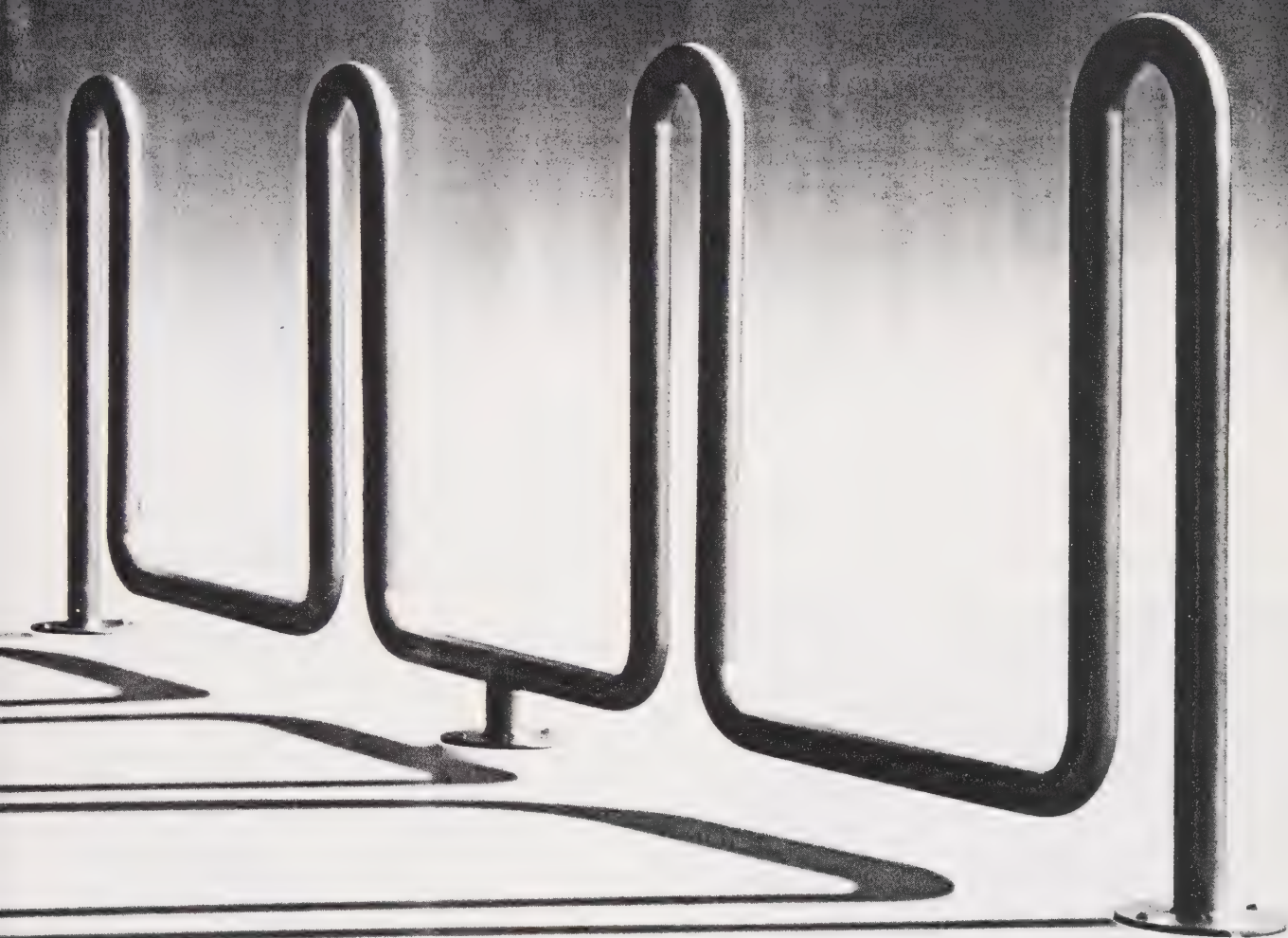
PLACEMENT SUGGESTIONS for the Bike Rib®

The Bike Rib® bike rack provides optimum flexibility in site orientation. It can be positioned in many ways—in parallel (as illustrated), end to end, at a 45 degree angle, in groups (see above right), or dispersed around a building.



Printed on Recycled Paper

A Cycle-Logical Progression.



The Bike Rib® Series II

The Next Generation of Linear Bike Racks

Finally— a linear bike rack that works as well as it looks!

The Bike Rib® Series II
allows easy access
and lock-up of bike—
frame and wheels.

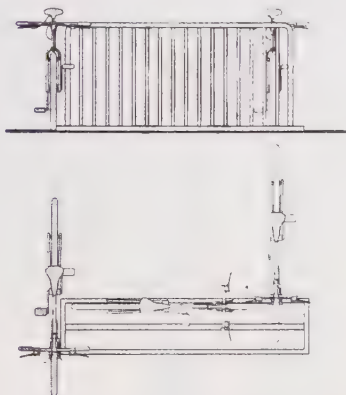


Making Bike Racks
That Work.

A LITTLE HISTORY...

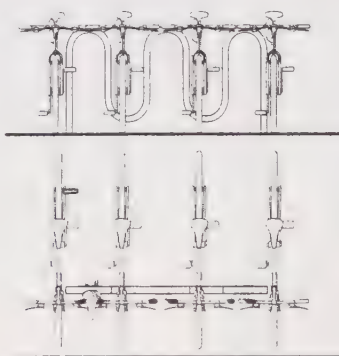
Traditional Linear Bike Racks

Obviously obsolete— it's not enough to lock just the front wheel. When used as intended, this design prohibits the use of the U-lock on the bike frame except when parking at either end of the rack. The remainder of the bikes are left unsecured.



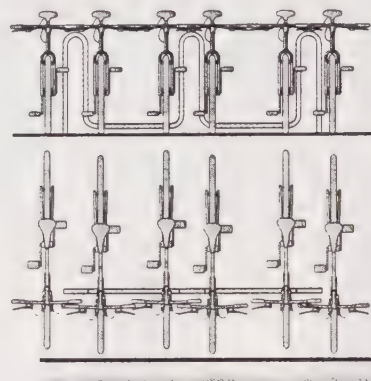
The Serpentine-Shaped Rack (adding visual appeal to bike parking)

Better than its predecessor, but the design creates its own set of problems. Difficulty in bike placement and access can cause this rack to become full at two thirds of its intended capacity. An interesting form, but not the most functional bike rack.

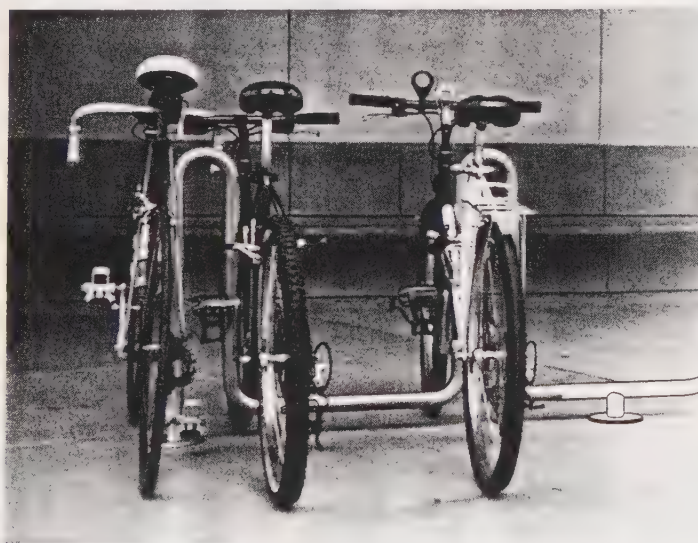


The Bike Rib® Series II (form following function)

Each bike has equal access to the rack for locking bike frame and front wheel (the front wheel is the most vulnerable to theft). Parking only requires access from one side and all bikes may be parked in the same direction. The rack may be placed as little as two feet from adjacent wall or object.



INTRODUCING THE BIKE RIB® SERIES II...



SPECIFICATIONS

1 1/2" (1 7/8" o.d.)
Galvanized Schedule 40 pipe

FINISH OPTIONS

• Powder Coat Paint:

A polyester powder coat is applied to galvanized pipe. Galvanized pipe is used as substrate to protect against rusting if paint scratching occurs. Standard colors: black wrinkle and metallic silver.

• Vinyl-Like Powdercoat:

A "kind to bikes" (soft to touch) thermoplastic coating applied to galvanized pipe provides excellent resistance to acids, weather, and abrasion.

2" Clearance

6" x 3/8" Steel
Base Plate

32"

COMPANY PHILOSOPHY

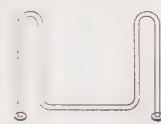
Function First Bike Security was established to encourage bicycle use as a transportation alternative to automobiles. Our goal is to provide products that support cycling.



Function First Bike Security
P.O. Box 44137
Tucson, AZ 85733-4137
(602) 322-9626

MODELS

Model numbers correspond to the number of bikes each rack holds.



MODEL BR4

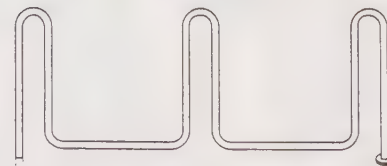


MODEL BR6



MODEL BR8

MOUNTING OPTIONS



IMBEDDED

The rack is left long at points of attachment: 4" for concrete imbedding to 12" for below grade with soft surface.

SURFACE MOUNT

This mount requires two holes per base plate, 1/2" d. approx. 2" deep, drop anchors and bolt down rack (bolts and anchors included).



APPENDIX F8

Locations for Bicycle Rack and Locker Placement

Class I	Class II - Racks
▶ Above ground at all BART/MUNI and MUNI stations	▶ Market at Fifth Street
▶ Ferry Building	▶ Market at Powell
▶ Caltrain	▶ Fisherman's Wharf
▶ Transbay Terminal	▶ Japantown (Post at Webster)
▶ Moscone Center	▶ Polk at California
▶ San Francisco General Hospital	▶ Farmer's Market (Alemany at Crescent)
▶ UC Medical Center	▶ Van Ness at Sutter (Theaters)
▶ St. Luke's Hospital (Valencia at Army)	▶ Haight at Cole
▶ California Pacific Medical Center (Arguello at California)	▶ Cliff House
▶ Cow Palace	▶ Lyon at Bay
▶ Stonestown Mall	▶ Mission Dolores
▶ San Francisco State University	▶ Dolores Park
▶ University of San Francisco (Turk at Masonic)	▶ 3rd Street at Folsom
▶ Lincoln College	▶ 2nd Street at Folsom
▶ John Adams Community College	▶ Folsom at 9th or 10th Streets
▶ The New College	
▶ San Francisco Art Institute	
▶ The Zoo (Sloat)	



APPENDIX G

BICYCLE POLICIES, ORDINANCES AND LEGISLATION

Recommended Additions to the Transportation Element of the Master Plan

Principles of California Traffic Laws

Palo Alto Bicycle Mileage Reimbursement Policies

Compaction and Smoothness Standards for Palo Alto Streets

San Francisco Bicycle Coalition - Bikes in the Freezer

Bibliography of Potential Training Materials



APPENDIX G1

RECOMMENDED ADDITIONS TO THE TRANSPORTATION ELEMENT OF THE MASTER PLAN

The City is currently revising its Master Plan. A Preliminary Working Draft of the Transportation Element was circulated in July. This element, which includes a section on bicycles, is generally thorough and well thought out, but it can be improved in a number of ways in terms of recognizing the bicycle as a legitimate mode of transportation. The following comments are referenced to the page number of the Transportation Element. *Italics* indicate suggested additions to the text.

- I2. Third paragraph, line 10: add *and bicycling* "as an alternative to the single occupant automobile."
- I5. The "Transit First" policy, as described, properly assigns a high priority to mass transit compared to the automobile. But it seems to pose a false dichotomy between automobiles and transit, as if these were the only two choices. Often there are other alternatives, such as bicycling and walking, that can also help to discourage increases in automobile traffic, and can be implemented cost-effectively in addition to or in place of transit without violating the spirit of "Transit First."
- G1. Policy 1 describes citizen participation in transportation planning systems on a geographical basis, but omits groups that have an interest in particular modes, such as bicyclists or transit riders.
- G3. Policy 5's intent is to "ensure choices among modes of travel." But merely "accommodat[ing] each mode when and where it is most appropriate" is much too restrictive. Thus, walking and bicycling would be accommodated in the very narrow range of circumstances in which they are, supposedly, superior to other modes. Although the distinction between bicycling and walking—which is substantial—needs to be specified more clearly, bicycling seems to be considered appropriate primarily in parks, on trails, and in other recreational areas.

This is far too limited. San Francisco is so compact that bicycling is a possibility for many intracity trips, including work and shopping trips, especially for low-income people. Whether people choose bicycling, walking, the automobile, or transit depends on, among other things, the familiarity and social acceptance of the mode, the distance traveled compared to the time available, weather, terrain, destination parking, the need to carry passengers or cargo, and perceived cost (often different from the real cost). It also depends on whether they are given a choice in the first place. "Ensuring choices among modes of travel" means providing for bicycles as a matter of course everywhere—on all streets in the City (except freeways), not just in a few highly specialized situations. Otherwise it is the City, through the Master Plan, that makes the "choice," not the user.

Reaching this goal may be a long process, and priorities will have to be set along the way, but it should still be the ultimate objective.

- G4. In describing the types of trips for which each mode should have priority, bicycling and walking should be given separate paragraphs. The four trip types listed are appropriate for walking but not for bicycling. The existing paragraph should be amended to delete the reference to bicycling, and a new paragraph added for bicycling with bullet points as follows:

Bicycling should be given priority for the following types of trips and/or in the specified areas:

- ▶ *Where there is high travel demand between two areas located between one and six miles apart.*
- ▶ *For trips to sites frequented by populations with traditionally low car ownership rates.*
- ▶ *For trips to dense areas where automobile parking is scarce.*
- ▶ *For trips to mass events where traffic and transit congestion are projected to occur.*
- ▶ *For trips along corridors serving transit centers.*
- ▶ *On roads or trails of particular scenic beauty.*

- G8. Policy 2 should mention that bicycling and walking are also quiet and non-polluting.

- G9. Policy 5 should add *for bicycle commuting*.

- R5. Add the following policy to Objective 7:

Policy 1

Encourage regional transit operators to allow bicycles during peak hours.

Many nonresidents of San Francisco commute to workplaces in sections of San Francisco outside the downtown area. Many drive alone and contribute to peak-hour traffic congestion. If regional transit were to carry bicycles during peak hours, these commuters could bicycle to their place of employment from regional transit stops, making bicycling an attractive alternative to driving alone. This policy would also reduce parking demand at suburban park-and-ride lots.

This objective does not need to be divorced from the others, or viewed as a special favor to bicyclists. It might equally well fit under Objective 2 (R1), "maintain and enhance San Francisco's position as the hub of a regional, city-centered transit system." Policy 6 under that objective (R2) is to "facilitate transfers between different transit modes and services." Carrying bicycles on transit is closely related to this policy; it facilitates transit as well as bicycling by extending the range and convenience of both modes.

- C2. Under Objective 2, Policy 1, add *and bicycling*. A similar change should be made to Policy 4 on C3.
- C4. When reducing road congestion through traffic control strategies that improve vehicular flow (Policy 1), it is essential not to improve level of service by restriping roadways for more lanes at the expense of width for lane-sharing by bicycles.

Although it would be better to reserve right-of-way space on "selected streets" (Policy 4) rather than on no streets at all, provision (not necessarily reservation) of sufficient right-of-way for lane-sharing should be an objective on all streets.

- C5. Policy 5 encourages locating single-occupant parking less conveniently than carpool and transit access—to which the following should be added *and also less conveniently than bicycle parking.*
- V2. The text under Policy 2 lists factors for judging acceptable levels of traffic for a street. It also states that "widening of streets at the expense of sidewalks or of setbacks should not occur..." The following text should be added to the list of factors:

- *The level of bicycle traffic.*

The following text should be inserted as a new paragraph at the end of the existing text:

In addition, widening of streets should not occur at the expense of bicycle travel. On streets with significant traffic volumes, bicyclists typically need four to five feet of roadway space between the line of traffic and the curb, and five to six feet of roadway space between the line of traffic and parked cars. Often widening to provide more travel lanes narrows the curb lane to the detriment of safe bicycling. No restriping projects that result in the narrowing of the curb lane should be implemented without the consultation and concurrence of the San Francisco Bicycle Advisory Committee and the City bicycle coordinator.

- V3. Provision for "introduction of exclusive bus, bike and carpool/vanpool lanes on bridges" (Policy 3) is an excellent idea, and bicycle access should be provided when these lanes are introduced.
- V4. To the text of Policy 2, promoting safety, add the elimination or repair of hazards to bicyclists such as parallel-bar sewer grates, diagonal railroad or streetcar tracks, and severe ruts and potholes, similar to what is included in Policy 4 on B2. As is also true elsewhere, certain policies may need to appear in several sections to ensure timely consideration.
- V5. Under "Classification of Elements," see the comment regarding G3. Bicyclists may be given special priority on "recreational streets," but this should not imply that other streets need not provide for bicycle use. Moreover, the Comprehensive Bicycle Plan will propose another street classification, the bicycle-priority street. This is a street, intended for transportation, not recreational, use, on which bicycles are given priority through preferential right-of-way at intersections, and devices such as barriers or traffic circles which restrict its use as an automobile thoroughfare.
- V7. Through, non-park, *motorized* traffic should be eliminated on John F. Kennedy Drive. If Kezar Way's capacity is reduced, it should retain accommodation for bicycles.
- T1. The principle that transit should follow transit preferential streets, and general traffic should be routed away from these streets, can also be adapted, within limits, to bicycles.

- T6. Policy 6, "Make convenient transfers possible," is very similar to Policy 6 on R2. This is appropriate; the policy needs to be in both places. But the same comments apply: part of encouraging intermodal transportation is providing bicycle access on transit and parking at transit stops.
- Pd2. Like transit preferential streets, the pedestrian street classification system also might be adapted, within limits, to bicycles.
- Pd3. Take care when widening sidewalks at corners to provide pedestrian queuing space and shorter crosswalk distances, whether this is done through corner bulbs, peninsulas, or in some other way. The accompanying narrowing of the roadway can squeeze bicycle and automobile traffic together at the intersection, and particularly increases the conflict between through bicyclists and right-turning motorists. It is desirable to post advance signs warning of the constriction, to taper the lane stripes, and if at all possible to restripe the roadway to preserve sufficient outside lane width.
- B1. Policy 1 is not entirely consistent. It refers to access "on city streets" as well as bikeways, but the text refers only to bikeways, which "may or may not have bicycle lanes," and a bikeway system. The term "bikeway" normally refers to either a bike path, a bike lane, or a bike route, not to a wide curb lane or other types of facilities. The policy should discuss bicycle accommodation on all roadways rather than just bikeways. (See also comments on G3.)

The reference to AASHTO is misleading, since California relies on the Caltrans Highway Design Manual rather than AASHTO for highway design standards, including bicycle facilities. Some of the Highway Design Manual's standards for bicycle facilities are mandatory under state law and must be observed regardless of the funding source.

It would be more helpful to say that projects should conform to both the most recent Highway Design Manual and the AASHTO standards, whichever is more rigorous, and that advisory and permissive guidelines as well as mandatory ones should be observed unless there is good reason for an exception. The most recent version of the AASHTO standards is the 1991 *Guide for the Development of Bicycle Facilities* (without the "New").

- B2. Add the following text under Policy 1 as the third sentence in the second paragraph and also to the Pedestrian Element, possibly under Objective 2, Policy 2:

Special attention should also be paid to identifying recommended routes to school for students who walk or bicycle to school.

Add the following text as Policy 2 (currently missing) under Objective 1:

Policy 2

Give priority to bicycles based on a rational classification system of Bicycle Preferential Streets.

Some of the recommended bikeways established pursuant to Policy 1 will logically be on major and secondary thoroughfares, since feasible alternatives to

these streets in many corridors do not exist. Where possible, Bicycle Preferential Streets should also be established in order to provide less congested alternatives for the bicyclist. A Bicycle Preferential Street typically would not be either a major thoroughfare or a Transit Preferential Street. A Bicycle Preferential Street would include design treatments that encourage all segments of the population to travel by bicycle, not just experienced bicyclists and bicycle commuters.

Add the following text as new Policy 3 (currently missing) under Objective 1:

Policy 3

Where through motor vehicle access is prohibited, either physically by design or through signage, through bicycle access should be permitted.

- B2. Policy 4 is correct, but safety improvements should not be restricted to "bicycle route streets." Again, priorities must be set for implementation, but safety on all streets should still be the ultimate objective. The hazards to be improved should include diagonal railroad or streetcar tracks and rough railroad crossings. It might prove clearer to separate safety improvement policies from maintenance policies.
- B5. The text under Objective 2 Policy 1 describes the current requirement for bicycle parking where automobile parking is required. Bicycle parking should also be provided in all new buildings, even where no automobile parking is provided. The following text should therefore be added to Policy 1 of Objective 2 after the first sentence:

Bicycle parking as well as shower and locker facilities should be provided in all new commercial buildings, both public and private.

- B5. Append the following text to Objective 2, Policy 3:

For long-term bicycle parking, such as at employment sites, bicycle parking should be located where it is visible by an attendant or security guard, monitored exclusively by an attendant, accessible (such as by key) only to those who have parked bikes, or located entirely inside the building.

Bicycle parking should accept U-locks, but should provide reasonable security with any type of lock. The policy fails to discuss levels of bicycle security or protection from weather.

Add Policy 5 to Objective 2:

Policy 5

Provide convenient, secure, and inexpensive bicycle parking at major recreational facilities and at all large sports, cultural, or other heavily attended events.

- B6. These policies—considering the needs of bicycling in all city decisions, integrating bicycle planning into short-range and long-range planning activities for all departments, and designating appropriate staff—are the most important in the section. Without them, recommendations for facility, educational, and enforcement improvements are likely to be overlooked, ignored, or forgotten. "Improve accommodation as much as possible," however, has no definite meaning, since whatever happens to be done is by one definition "as much as possible."
- Pk2. The recommendation in Objective 1, Policy 1, that new or enlarged parking facilities include secure, convenient bicycle parking is welcome. Bicycle parking should also be included in Policy 4 (rapid transit stations) and Policy 5 (off-street parking); Objective 2, Policy 2 (downtown peripheral parking structures); Objective 3, Policy 1 (visitor parking at institutions); Objective 4, Policy 1 (new housing); and elsewhere as appropriate. It would not be enough to describe bicycle parking exclusively in the plan's Bicycle section, since planners will look at that section only if they already have bicycles in mind. Planners looking primarily for parking guidelines also need to be instructed on bicycle parking.
- Pk6. Objective 4, Policy 2 is to use existing street space to increase residential parking by shifting from parallel to diagonal or perpendicular parking. This policy must be carried out with great care. Both the effective street narrowing and the diagonal or perpendicular parking itself present increased hazards to bicyclists, who must be considered along with the transit operations that the policy mentions. To ensure the safety of bicyclists, diagonal parking should only be provided on non-through streets or those with very wide curb lanes.

The following additions should therefore be made to the text under Policy 2:

"to avoid conflicts with transit operations and bicycle travel and to ensure that the street is more than a parking lot and that bicycle travel is not adversely affected."

- Pk7. Add the following text under Policy 5:

"An increase in the number of driveways also increases the potential conflicts between motorists and bicyclists."

- Pk8. Add the following text under Policy 2, last paragraph:

"and access conflicts to pedestrians, bicyclists and transit."

- GM2. It is important to coordinate truck route and bike route planning. Trucks and bikes should be routed onto separate streets where possible. Trucks' greater width and length, obstructed rear sight lines, large turning radius, and off-tracking (the tendency when turning for the rear wheels to follow a smaller circle than the front wheels) all present special hazards to bicycles.

A study published recently in the *British Medical Journal*⁽¹⁾ found that trucks accounted for 6 percent of the traffic in central London but were involved in 58 percent of cyclist deaths. Left turns (equivalent to U.S. right turns) were particularly hazardous. Of 10 fatal bicycle accidents in San Francisco between 1989 and 1993, eight involved motor vehicles; of these, four involved trucks or buses.

(1) Katie Gilbert and Mark McCarthy, "Deaths of Cyclists in London 1985-92: The Hazards of Road Traffic." *British Medical Journal* 1994; 308:1534-7 (11 June 1994).



APPENDIX G2

PRINCIPLES OF CALIFORNIA TRAFFIC LAW

Local Law is Preempted by the State

Under the California Constitution, the powers of a county or city, as well as a charter city and county (San Francisco is the sole example), are provided by the Legislature. Counties and cities may establish and enforce police regulations that do not conflict with general laws. In the case of traffic law there is such a conflict. According to Vehicle Code §21, that code's provisions are applicable and uniform throughout the state and in all counties and cities, and no local authority may enact or enforce any ordinance on the matters covered by it unless expressly authorized. This doctrine, known as preemption, has been in effect at least since 1935, although counties and cities have not always recognized it or observed it faithfully.

Accordingly, a city or county's police powers do not extend to the control of traffic on its streets. Instead, the California Supreme Court has held repeatedly that local authorities have no police power in that area at all, unless expressly authorized by the Legislature. (Local police do, of course, have the authority to enforce state law.)

The operation of bicycles on highways is one of the matters regulated by the state under the provisions of the Vehicle Code. All local regulation of bicycle riding is therefore preempted, except where expressly authorized. Such authorization is very limited. It permits regulating the operation of bicycles on sidewalks (§21100(h)), bicycle registration (authorized in §21206, with the details spelled out in Division 16.7), the parking and operation of bicycles on pedestrian or bicycle facilities (§21206), and the prohibition of bicyclists from freeways under local control (§21960).

From 1963 through 1976, state law did allow cities and counties to regulate the operation and use of bicycles on streets as well as on sidewalks. This former statute is probably the basis for many local ordinances still on the books. Effective in 1977, however, the Legislature removed this authority in order to promote statewide uniformity, and the rules governing bicycles on streets are now identical throughout the state.

The doctrine of preemption has two major consequences for the City and County of San Francisco. First, San Francisco's municipal ordinances should be consistent with state traffic law, and should neither duplicate or contradict it. Second, certain regulations that the City might want to adopt may first require the enactment of or amendments to enabling state law.

Bicycles Must Obey Traffic Law

Because "vehicle," as defined in §670 of the Vehicle Code, does not include a device moved exclusively by human power, a bicycle is not technically considered a vehicle.⁽²⁾ However, for many purposes bicycles are nonetheless treated as if they were vehicles. According to §21200, "Every person riding a bicycle upon a highway has all the rights and is subject to all the provisions applicable to the driver of

⁽²⁾ A device used exclusively upon stationary rails or tracks, such as a streetcar or a cable car, is also not a vehicle.

a vehicle by this division, except those provisions which by their very nature can have no application." The division cited is Division 11, headed "Rules of the Road." Traffic laws that apply to all vehicles—including motor vehicles, the most familiar kind—therefore apply to bicycles as well.

The law thus accords with the vehicular-cycling principle, accepted and practiced by experienced bicyclists, that cyclists should act and be treated as drivers of vehicles. In addition, the Vehicle Code contains some special rules for bicycles, some special rules for motor vehicles, and some rules that apply to certain vehicles but not to others (or to bicycles).

The reasons for this dualistic system, in which bicycles are legally distinct from vehicles but are largely subject to the same rules, are lost in history, but seem to be connected with an attempt to relieve child bicyclists of consequences for their actions.

For example, drivers of vehicles must obey signs and signals (§21461(a)). As a consequence of §21200, bicyclists must also obey these signs and signals, including those that regulate or prohibit bicycles. But the signs and signals must be erected or maintained to indicate or carry out a provision of the Vehicle Code or a local traffic ordinance or resolution. If the Vehicle Code does not contain such a provision, or expressly authorize such a local ordinance or resolution, then the sign or signal has been improperly erected or maintained and cannot be enforced. For instance, a "Bicycles Must Use Sidewalk" sign would be improper and unenforceable, even if backed by a corresponding local ordinance.



APPENDIX G3

PALO ALTO BICYCLE MILEAGE REIMBURSEMENT POLICIES

It is the policy of the City of Palo Alto to discourage the use of single-occupant automobiles when the use of an alternative is available and feasible. It is also the City's policy to assure that employees and City officials are reimbursed for the use of private transportation while conducting authorized City business. The procedures which follow pertain to the use of privately-owned bicycles for the conduct of City business and the use of City-owned bicycles for City business and commuting.

Employees and City officials are to be reimbursed for the use of a private bicycle while conducting local authorized City business or attending local approved conferences, professional meetings, or training sessions. Reimbursement shall be at the rate of seven cents (\$.07) per business mile, and shall be applied for in compliance with Policy and Procedures 1-2. Reimbursement will not be provided for use of a City-owned bicycle.

This policy is applicable to temporary or contract employees only with prior approval from the City Manager or his/her designee.

PROCEDURE

Employees wishing to use a private or City-owned bicycle to conduct authorized City business must obtain prior approval from their department or division head and must comply with all safety requirements:

- ANSI or Snell approved helmets must be worn.
- All laws applicable to bicycle use as called for in the California Vehicle Code must be followed.
- All local ordinances or laws pertaining to the use of bicycle lanes, paths, trails, etc. must be followed.
- Bicyclists will use defensive driving techniques for their protection as well as for the protection of others.

City-owned bicycles may be used for commuting purposes, to and from home. If used for commuting purposes the employee must be registered in the Commute Alternatives Program. Each bicycle must be equipped with reflectors and lights if used after dark.

Employees shall contact the City of Palo Alto Commute Coordinator to request a City-owned bicycle.

Implementation of this policy shall be the responsibility of each department and the City of Palo Alto Commute Coordinator.



APPENDIX G4

Public Works Department
Engineering Division
(415) 329-2151

April, 1991

TO ALL INTERESTED PARTIES

RE: Compaction and Smoothness Standards for Palo Alto Streets

As a result of numerous requests for further information on compaction and smoothness standards in Palo Alto, the Public Works Department - Engineering Division has compiled this brief outline on them and how they are executed. Palo Alto is known for its tough inspection standards and is an important source for enforcement of these high street standards.

Also addressed below are several areas where Palo Alto attempts to minimize other hazards to bicyclists.

TRENCHING

Our Public Works Inspectors have produced an outline of the policies & procedures for utility trench work performed in Palo Alto (see Attachment #1). This provides an idea of how our standards are executed. You might note that every sizable trench (greater than 20 square feet) has compaction testing done. This testing is contracted out to a testing service to insure professional results. Only when the trench backfill passes the compaction test will the final surface course of asphalt concrete be placed. This attention to the compaction of the subgrade will insure the future integrity of the trench.

Also note (Attachment #1, Detail #1) that the asphalt concrete surface layer is removed (or "keyed in") an additional 6 inches beyond the actual trench line to insure a more stable section of AC at the edge of the restored trench.

When the trench is left unattended, it is either steel-plated (with ramps of cold-mix asphalt, or cutback, placed along edges of plate) or backfilled with base material and a surface course of cutback. In addition, it may be protected by barricades with flashers.

COMPACTION AND SMOOTHNESS OF FINISHED AC SURFACE COURSE

The City of Palo Alto requires that the compaction of asphalt concrete meet the requirements of Section 39-6.03 of Caltrans Standard Specifications (See Attachment #2).

WEDGE CUT

When a street is resurfaced with an asphalt overlay, our specifications require the contractor to grind down the existing asphalt in the area adjacent to the gutter lip the depth of the AC to be placed on the street (see Attachment #3). Temporary asphalt ramps are installed at all wedge cuts located at intersections, pedestrian and bike crossings to provide a transition at the vertical differential. When AC is finally placed on the street, the level of the asphalt matches the level of the gutter within 1/4 inch. This eliminates the longitudinal edge that can be a hazard to cyclists.

WATER PONDING IN BIKE LANE

Another potential hazard for cyclists is ponding in bike lanes due to upheaved curb and gutter. Every two years a survey crew inspects every linear foot of curb and gutter within the city limits. The crew identifies obvious sections of curb/gutter that are raised, sunken, or have some vertical differential that would cause ponding. High on the priority list is repair of curb/gutter sections that cause ponding in bicycle lanes.

STRIPING

Certain types of striping, especially thermoplastic striping, can be hazardous to bicyclists when wet. The City of Palo Alto writes into its specifications that bike lane legends are to be pavement marking tape, which is much less slippery.

STREET MAINTENANCE MANAGEMENT

The City of Palo Alto has a computer database titled: "Pavement Maintenance Management System" which provides reports on the current condition of every street in the city. This database is kept current through regular updating by an actual street condition survey. Through the use of these reports, city maintenance personnel are able to identify and prioritize maintenance needs throughout the city. The use of this valuable tool, together with input from other sources, assist in effectively maintaining a high standard of street condition in Palo Alto.

CONCLUSION

This painstaking attention to details pertaining to bicycle safety and the ride quality of the streets may contribute to Palo Alto's reputation as a "bicycle-friendly city".

UTILITY TAG RESTORATION POLICY/PROCEDURES

MARCH, 1991

1. TRENCHING IN THE STREET

- A. SAWCUTTING, EXCAVATION AND BACKFILLING IS DONE ACCORDING TO THE CITY STANDARD. SEE TRENCH DETAIL #1.
- B. SAND/BASE ROCK BACKFILL WITH THE TOP 2 FEET COMPACTED TO 95%. JETTING IS ALLOWED ON SAND ONLY - MECHANICALLY COMPACT BASE ROCK. NO NATIVE BACKFILL IS ALLOWED. REMOVE ALL DEBRIS FROM THE SITE.
- C. COMPACTION (DENSITY) TESTS ARE USUALLY TAKEN ON WEDNESDAYS AND FRIDAYS, DEPENDING ON THE WORK LOAD, BY AN OUTSIDE TESTING FIRM.
- D. UTILITY PERSONNEL MAY RESTORE CONCRETE BASE STREET ROUGH POUR. ALLOW FOR A 1 1/2" A.C. OVERLAY. PLUS OR MINUS 1/4".
- E. PUBLIC WORKS OPERATIONS RESTORES THE SURFACE IN KIND AFTER THE UTILITY TAG HAS BEEN SIGNED OFF BY THE PUBLIC WORKS INSPECTOR INDICATING THAT THE ABOVE WORK HAS BEEN COMPLETED. ASPHALT THICKNESS IN DEEP-LIFT/BASE FAILURE AREAS SHALL BE DETERMINED BY THE PUBLIC WORKS INSPECTOR BASED ON THE THICKNESS OUTSIDE THE AREA, PMMS OR THE IMPROVEMENT PLANS.

2. TRENCHES IN OR CROSSING SIDEWALK, CURB AND GUTTER

- A. SAWCUT CURB, GUTTER AND WALK FULL DEPTH AND FULL WIDTH. SAWCUT WALK ON THE NEAREST SCORE MARK THAT WILL ELIMINATE ANY LOOSE CONCRETE. SPALLED CONCRETE WALK MUST BE RECUT TO THE NEAREST SCORE MARK. SPALLED CURB/GUTTER MUST BE RECUT TO ELIMINATE THE SPALL. SEE DETAIL #2. A SPALL IS A CHIP WHICH EXTENDS MORE THAN 1" PAST THE SAWCUT.
- B. THERE MUST BE AT LEAST 7" BETWEEN BOXES AND 7" BETWEEN THE BOX AND THE SAWCUT.
- C. SAND/BASE ROCK BACKFILL WITH THE TOP 2 FEET COMPACTED TO 95%. JETTING IS ALLOWED ON SAND ONLY - MECHANICALLY COMPACT BASE ROCK. NO NATIVE BACKFILL IS ALLOWED. REMOVE ALL DEBRIS FROM THE SITE.
- D. COMPACTION (DENSITY) TESTS ARE USUALLY TAKEN ON WEDNESDAYS AND FRIDAYS, DEPENDING ON THE WORK LOAD, BY AN OUTSIDE TESTING FIRM.
- E. PUBLIC WORKS OPERATIONS RESTORES THE SURFACE IN KIND AFTER THE UTILITY TAG HAS BEEN SIGNED OFF BY THE PUBLIC WORKS INSPECTOR INDICATING THAT THE ABOVE WORK HAS BEEN COMPLETED.

3. UTILITY CUTS LARGER THAN 20 SQUARE FEET OF STREET SURFACE

- A. ON ASPHALT SURFACE STREETS, AGGREGATE OR CONCRETE BASE, SAWCUT OR JACK HAMMER TO REMOVE A SQUARE OR RECTANGULAR SHAPE SECTION WITH VERTICAL EDGES. A CUT MADE WITH A JACK HAMMER MUST LEAVE A STRAIGHT, UNSPALLED, VERTICAL EDGE. IF THIS CAN NOT BE ACCOMPLISHED, THEN A SAW MUST BE USED. SAWCUT ONLY IN A CONCRETE SURFACE STREET.
- B. SAND/BASE ROCK BACKFILL WITH THE TOP 2 FEET COMPACTED TO 95%. JETTING IS ALLOWED ON SAND ONLY - MECHANICALLY COMPACT BASE ROCK.
- C. GRADE THE SAND/BASE ROCK SO THAT THE ASPHALT/CONCRETE CAN BE PLACED IN A CONSISTANT THICKNESS. (DON'T FORGET THE CORNERS)
- D. REMOVE ALL DEBRIS (CONC./AC/DIRT) FROM THE SITE. BRUSH THE VERTICAL EDGES FREE OF LOOSE MATERIAL.
- E. IF THE EDGES ON AN ASPHALT SURFACE STREET SPALL - YOU NEED ONLY TRIM THE ASPHALT. IF A CONCRETE SURFACE STREET SPALLS, THE DAMAGED SECTION MUST BE SAWCUT AND REMOVED.
- F. COMPACTION (DENSITY) TESTS ARE USUALLY TAKEN ON WEDNESDAYS AND FRIDAYS, DEPENDING ON THE WORK LOAD, BY AN OUTSIDE TESTING FIRM.
- G. UTILITY PERSONNEL MAY RESTORE CONCRETE BASE STREET ROUGH POUR. ALLOW FOR A 1 1/2" A.C. OVERLAY. PLUS OR MINUS 1/4".
- H. PUBLIC WORKS OPERATIONS RESTORES THE SURFACE IN KIND AFTER THE PUBLIC WORKS INSPECTOR SIGNS OFF ON THE UTILITY TAG INDICATING THE ABOVE WORK HAS BEEN COMPLETED.

4. UTILITY CUTS SMALLER THAN 20 SQUARE FEET OF STREET SURFACE ARE TREATED THE SAME AS THE ONES OVER 20 SQUARE FEET WITH THE FOLLOWING EXCEPTIONS -

- A. NOT ALL OF THEM ARE TESTED FOR COMPACTION.
- B. THE EXCAVATED DIRT/BASE ROCK MAY BE REUSED AS LONG AS THE BASE ROCK IS NOT CONTAMINATED.
- C. THE DIRT/BASE ROCK MUST BE MECHANICALLY COMPACTED - NO JETTING.

NOTES:

1. THE PUBLIC WORKS INSPECTOR WILL PICK UP THE DAILY WORK ASSIGNMENTS FOR EACH UTILITY CREW FROM THE UTILITY DEPARTMENT SUPERVISORS EACH MORNING. THE PUBLIC WORKS INSPECTOR WILL THEN MAKE PERIODIC SITE VISITS TO ANSWER ANY QUESTIONS AND APPROVE THE PROGRESS.

2. ALL VALVE BOXES ARE TO BE SET TO GRADE AND ENCASED IN CONCRETE PRIOR TO FINAL INSPECTION. ALLOW FOR A MINIMUM OF 1 1/2" OF AC.

3. THE ABOVE PROCEDURES ARE INTENDED TO CLARIFY "IN HOUSE" METHODS OF RESTORATION. SECTION 20 OF THE CITY STANDARD SPECS REMAINS AS THE STANDARD FOR ALL TRENCH RESTORATION.

MARCH, 1991

DETAIL #2

UTILITY TAG RESTORATION

ASPHALT
DRIVE WAY

SAWCUT 6" TO
ALLOW FOR A FORM
(AC DRIVE ONLY)

BACK OF WALK

5' WALK

SAWCUT ON
SCORE LINES
FULL WIDTH OF
WALK

SAWCUT HERE
IF XING WALK

SCORE
MARKS

SAWCUT AT
BACK OF CURB.

CURB

SAWCUT AT
BACK OF CURB.

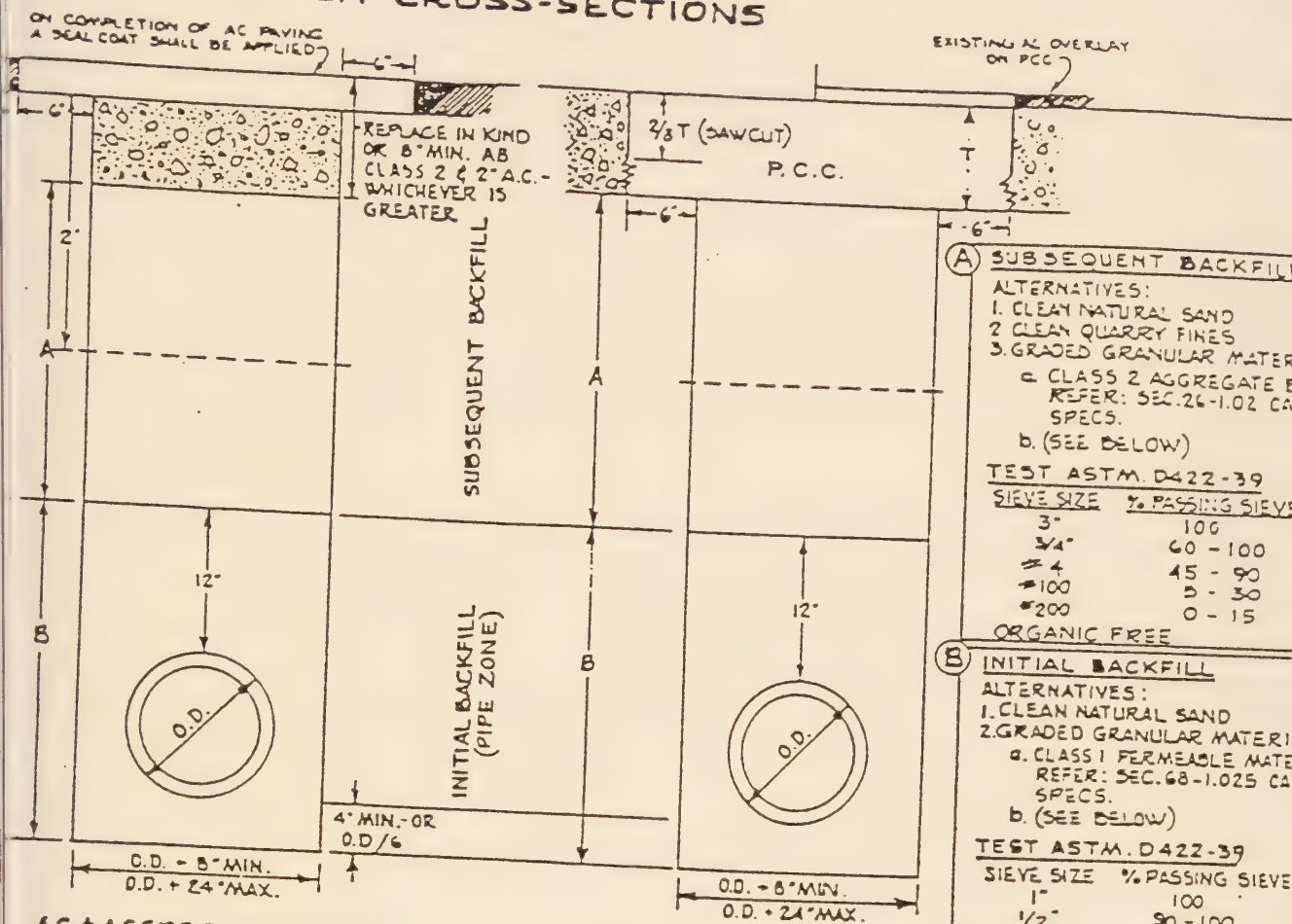
GUTTER

SAWCUT STREET
6" TO ALLOW FOR A
FORM AT THE LIP OF
GUTTER.

ASPHALT STREET

DETAIL #1 UTILITY TAG RESTORATION

TYPICAL TRENCH CROSS-SECTIONS



(A) SUBSEQUENT BACKFILL
ALTERNATIVES:
1. CLEAN NATURAL SAND
2. CLEAN QUARRY FINES
3. GRADED GRANULAR MATERIAL
a. CLASS 2 AGGREGATE BASE
REFER: SEC. 26-1.02 CALIF.
SPECS.
b. (SEE BELOW)
TEST ASTM. D422-39
SIEVE SIZE % PASSING SIEVE
3" 100
3/4" 60 - 100
#4 45 - 90
#100 5 - 30
#200 0 - 15
ORGANIC FREE

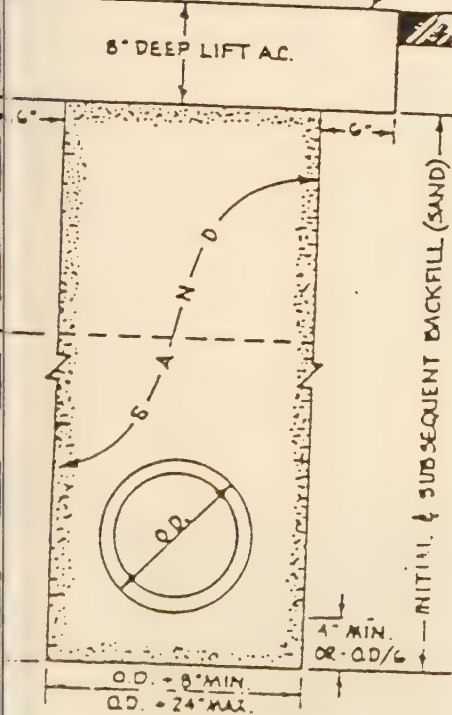
(B) INITIAL BACKFILL
ALTERNATIVES:
1. CLEAN NATURAL SAND
2. GRADED GRANULAR MATERIAL
a. CLASS 1 PERMEABLE MATERIAL
REFER: SEC. 68-1.025 CALIF.
SPECS.
b. (SEE BELOW)
TEST ASTM. D422-39
SIEVE SIZE % PASSING SIEVE
1" 100
1/2" 90 - 100
#4 50 - 90
#50 10 - 30
#200 0 - 15
MIN. SAND EQUIV. 30

JETTING NOTES

1. WHEN JETTING PERMITTED: EXCESS WATER COLLECTED AT LOW POINTS AND REMOVED BY PUMPING.
2. AS AUTHORIZED, JETTING AND VIBRATION MAY CONTINUE TO MAXIMUM LIFTS OF 4 FT. JET SPACING - NOT TO EXCEED 6 FEET.
3. LAST 24" OF TRENCH 95% RELATIVE COMPACTION (MECHANICAL)
4. UNIMPROVED AREAS: (SETTLEMENT UNOBJECTIONABLE) JET OR MACHINE TAMP TO 85% RELATIVE COMPACTION.
5. IMPROVED AREAS:
 - a. INITIAL BACKFILL - JETTING OF SAND OK
 - b. SUBSEQUENT BACKFILL: JETTING (SAND) SUBJECT TO APPROVAL OF CITY ENGINEER

AC & AGGREGATE BASE

ON COMPLETION OF AC PAVING
A SEAL COAT SHALL BE APPLIED



DEEP LIFT A.C. & SAND

APPROVED:
October 20, 2011
Ray Lindner
ENGINEER
23658
REG. ENGINEER

TYPICAL TRENCH CROSS-SECTIONS

SCALE
N.T.S.

FILE NO.

DRAWN BY: 8 10-81

CITY OF BALTIMORE

DESIGNED BY

SECTION 39

ASPHALT CONCRETE

of asphalt concrete for the adjoining through lane has been spread and compacted. At locations where the number of lanes is changed, the top layer for the through lanes shall be paved first. When existing pavement is to be surfaced and the specified thickness of asphalt concrete to be spread and compacted on the existing pavement is 0.20-foot or less, shoulders or other adjoining areas may be spread simultaneously with the through lane provided the completed surfacing conforms to the requirements of these specifications. Tracks or wheels of spreading equipment shall not be operated on the top layer of asphalt concrete in any area until final compaction has been completed.

At locations shown on the plans, specified in the special provisions or as directed by the Engineer, the asphalt concrete shall be tapered or feathered to conform to existing surfacing or to other highway and non-highway facilities.

At locations where the asphalt concrete or asphalt concrete base is to be placed over areas inaccessible to spreading and rolling equipment, the asphalt concrete or asphalt concrete base shall be spread by any means to obtain the specified results and shall be compacted thoroughly to the required lines, grades and cross sections by means of pneumatic tampers, or by other methods that will produce the same degree of compaction as pneumatic tampers.

39-6.02 Spreading.—In advance of spreading asphalt concrete over an existing base, surfacing, pavement, or bridge deck, if ordered by the Engineer, asphalt concrete shall be spread to level irregularities, and to provide a smooth base in order that subsequent layers will be of uniform thickness. The asphalt concrete for levelling irregularities and to provide a smooth base may be spread with any equipment conforming to the requirements in Section 39-5.01, "Spreading Equipment." No additional compensation will be allowed for spreading asphalt concrete as above specified, and full compensation for all work incidental to such operations will be considered as included in the contract price or prices paid for the asphalt concrete.

When directed by the Engineer, paint binder shall be applied to any layer in advance of spreading the next layer.

Before placing the top layer adjacent to cold transverse construction joints, such joints shall be trimmed to a vertical face and to a neat line. Transverse joints shall be tested with a 12-foot straightedge and shall be cut back as required to conform to the requirements specified in Section 39-6.03, "Compacting," for surface smoothness. Connections to existing surfacing shall be feathered to conform to the requirements for smoothness. Longitudinal joints shall be trimmed to a vertical face and to a neat line if the edges of the previously laid surfacing are, in the opinion of the Engineer, in such condition that the quality of the completed joint will be affected.

All layers, except as otherwise provided in Section 39-6.01, "General Requirements," and in this Section 39-6.02, shall be spread with an asphalt paver. Asphalt pavers shall be operated in such a manner as to insure continuous and uniform movement of the paver.

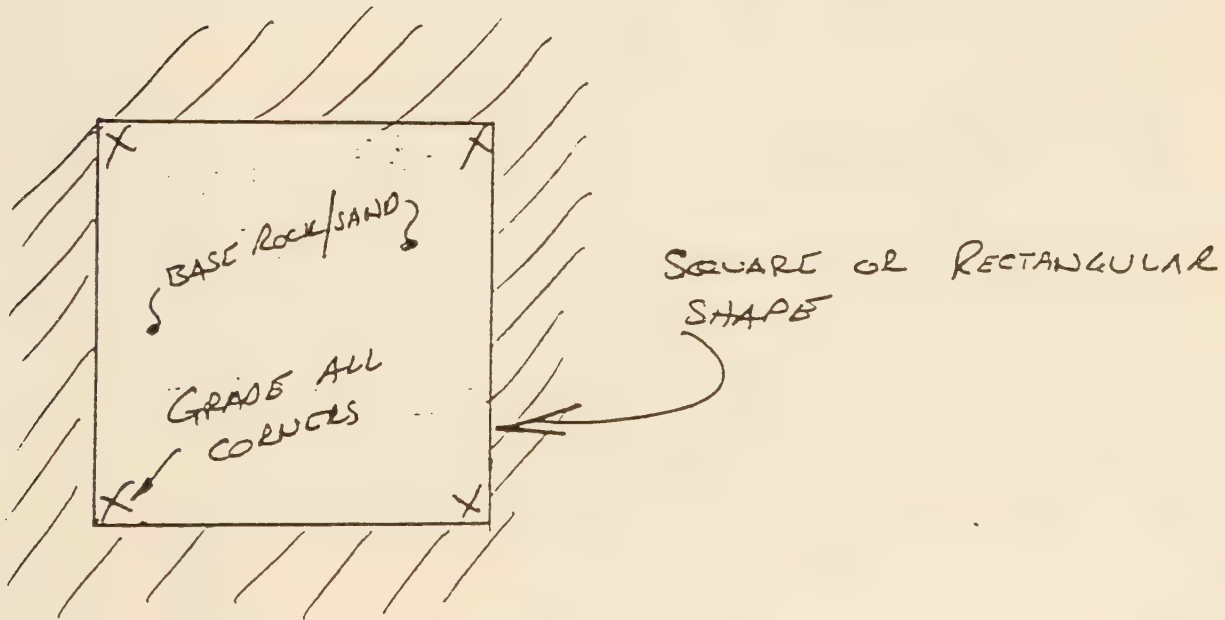
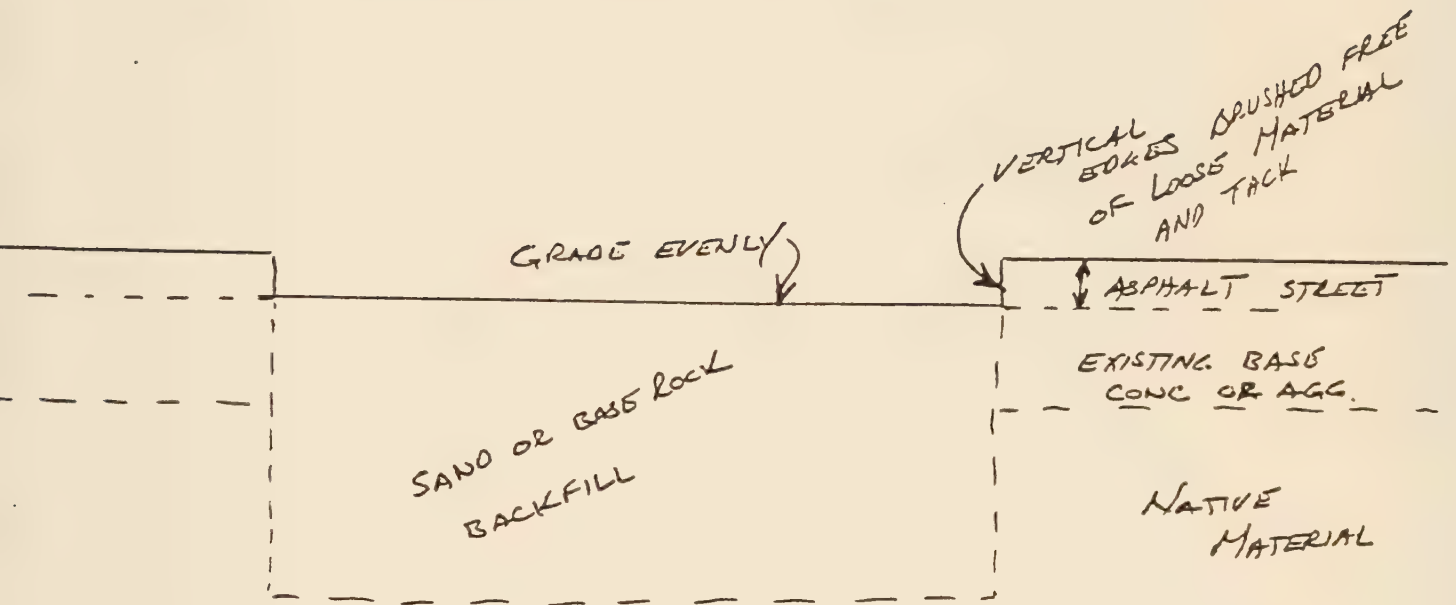
39-6.03 Compacting.—Compacting equipment shall conform to the provisions of Section 39-5.02, "Compacting Equipment."

A pass shall be one movement of a roller in either direction. A coverage shall be as many passes as are necessary to cover the entire width being paved. Overlap between passes during any coverage, made to insure compaction without displacement of material in accordance with good rolling

MARCH, 1991

DETAIL # 3

UTILITY TAG RESTORATION



SECTION 39

ASPHALT CONCRETE

practice, shall be considered to be part of the coverage being made and not part of a subsequent coverage. Each coverage shall be completed before subsequent coverages are started.

Rolling shall commence at the lower edge and shall progress toward the highest portion, except that when compacting layers which exceed 0.25-foot in compacted thickness, and if directed by the Engineer, rolling shall commence at the center and shall progress outwards.

Compaction of Open Graded asphalt concrete shall consist of 2 coverages. If necessary, only one coverage of the Open Graded asphalt concrete may be ordered by the Engineer to prevent a break in the bond of asphalt between the aggregate particles.

All other asphalt concrete and asphalt concrete base shall be compacted as follows:

Initial or breakdown compaction shall consist of 3 coverages of a layer of asphalt mixture and shall be performed with a 2-axle or 3-axle tandem or a 3-wheel roller weighing not less than 12 tons. Where the thickness of the layer of asphalt mixture is less than 0.15-foot, fewer coverages than specified above may be ordered by the Engineer if necessary to prevent damage to the layer being compacted.

The initial or breakdown compaction shall be followed immediately by additional rolling consisting of 3 coverages with a pneumatic-tired roller. Coverages with a pneumatic-tired roller shall start when the temperature of the mixture is as high as practicable, preferably above 180° F., and shall be completed while the temperature of the mixture is at or above 150° F.

Each layer of asphalt concrete and asphalt concrete base shall be compacted additionally without delay by a final rolling consisting of not less than one coverage with a steel-tired roller weighing not less than 8 tons. Except as otherwise provided for low rates of production, a separate finish roller will be required.

Rolling shall be performed so that cracking, shoving or displacement will be avoided.

Rolling, where 3-axle tandem rollers may be used as specified in this Section 39-6.03, shall be under the control of the Engineer, but in general, no 3-axle tandem roller shall be used in rolling over a crown or on warped sections when the center axle is in the locked position.

Provided it is demonstrated to the satisfaction of the Engineer that one roller can perform the work, the required minimum rolling equipment specified above may be reduced to one 2-axle tandem roller, weighing at least 8 tons, for each paver under any of the following conditions:

- (1) When asphalt concrete or asphalt concrete base is placed at a rate of 50 tons, or less, per hour at any location.
- (2) When asphalt concrete or asphalt concrete base is placed at a rate of 100 tons, or less, per hour and at the locations or under the conditions as follows:
 - (a) Placed on miscellaneous areas in accordance with the provisions in Section 39-7.01, "Miscellaneous Areas."
 - (b) When the width to be placed is less than 8 feet.
 - (c) When the total thickness to be placed is less than 0.1-foot.
- (3) When the total amount of asphalt concrete and asphalt concrete

ASPHALT CONCRETE

base included in

When rolling equipment the rolling required with said tandem roller.

Alternative compaction in accordance with California down compaction in conditions designated pneumatic-tired rollers which has been used as the finish roller and is a finish roller and is

During rolling of asphalt concrete or asphalt concrete. Applying water shall be used. No layer shall be compacted by the Engineer.

The completed surface shall be free from ruts, bumps, holes or other objectionable conditions by blading or other means. The use of any objectionable marking equipment is not acceptable equipment.

When a straightedge is used parallel with the centerline from the lower edge of the finished surface shall be greater than 0.02-foot long laid in a direct edge to edge of a 10-foot.

Pavement within 10 feet to the smoothness of Bridge Decks."

39-7.01 Miscellaneous areas as median areas (except dikes, gutters, gutter drainage structures, designated on the plans for concrete, shall conform to the following:

The combined aggregate for laneous areas shall be placed on the travel lanes. The amount of asphalt for gutters, gutter flare structures, unless otherwise specified, shall be one percent by weight of the asphalt mixture used in the asphalt concrete.

The asphalt concrete shall be placed in one layer. The material shall be

base included in the contract is 1,000 tons, or less.

When rolling equipment is reduced as provided in this Section 39-6.03, the rolling requirements may be reduced to at least 3 complete coverages with said tandem roller.

Alternative compacting equipment, approved by the Engineer in accordance with California Test 113, may be used for the initial or breakdown compaction if operated according to the procedures and under the conditions designated in the approval. Additional compaction with pneumatic-tired rollers will not be required when approved alternative equipment has been used for the initial compaction. A vibratory roller may be used as the finish roller provided that it meets the requirements for a finish roller and is operated with the vibratory unit turned off.

During rolling operations, and when ordered by the Engineer, the asphalt concrete or asphalt concrete base shall be cooled by applying water. Applying water shall conform to the provisions in Section 17, "Watering." No layer shall be cooled with water unless so ordered or permitted by the Engineer.

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations, or other objectionable marks in the asphalt concrete shall be discontinued, and acceptable equipment shall be furnished by the Contractor.

When a straightedge 12 feet long is laid on the finished surface and parallel with the center line, the surface shall not vary more than 0.01-foot from the lower edge of the straightedge. The transverse slope of the finished surface shall be uniform to a degree such that no depressions greater than 0.02-foot are present when tested with a straightedge 12 feet long laid in a direction transverse to the center line and extending from edge to edge of a 12-foot traffic lane.

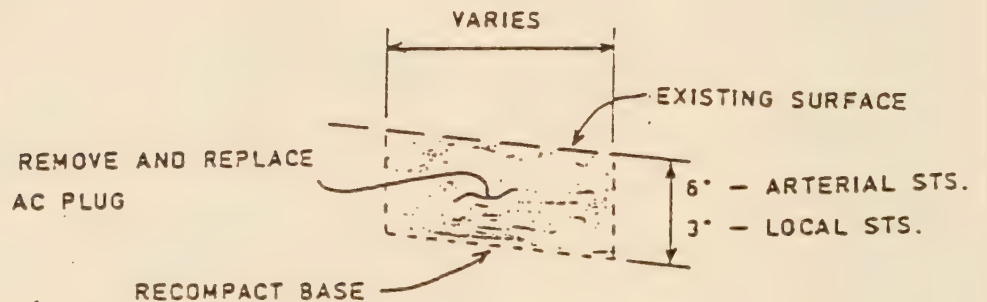
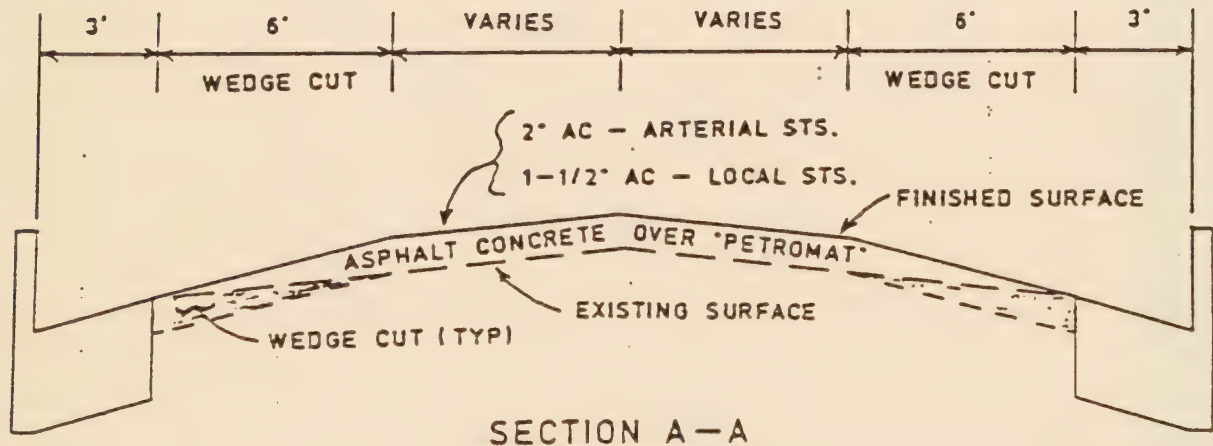
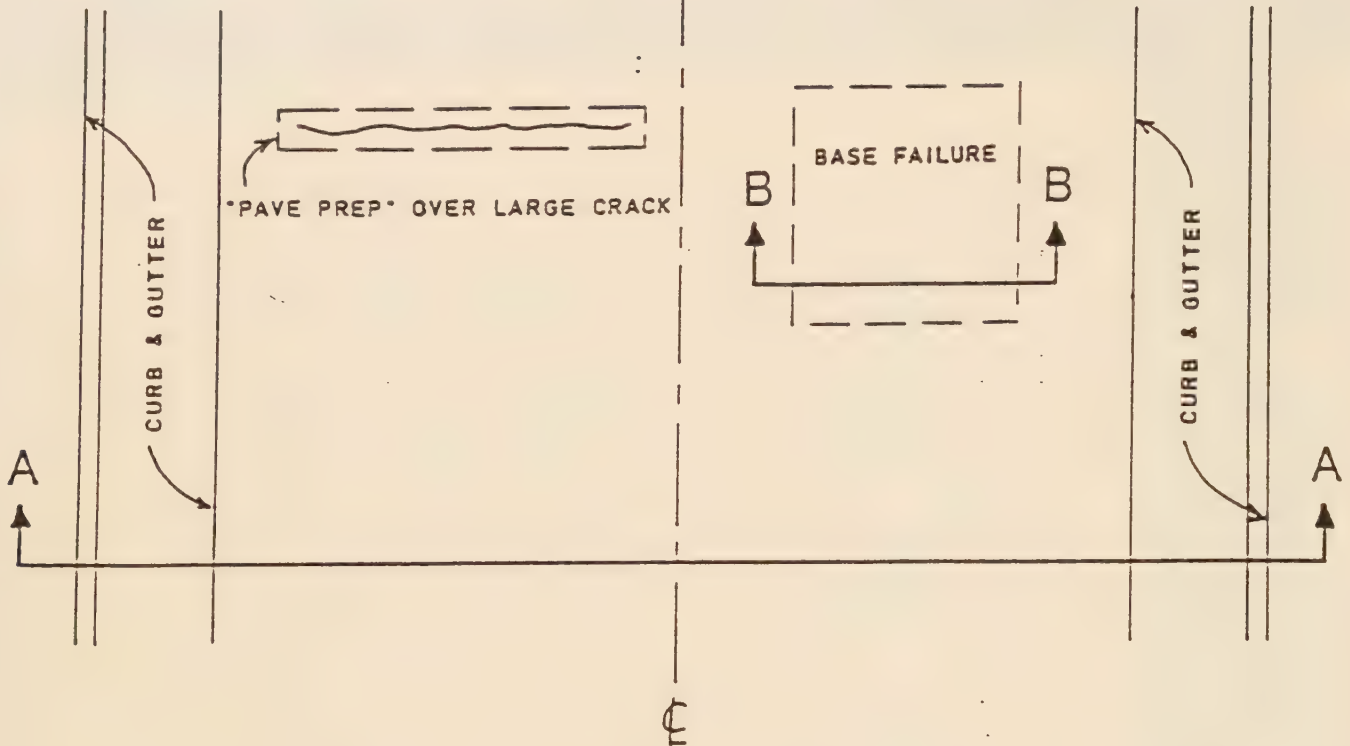
Pavement within 50 feet of a structure or approach slab shall conform to the smoothness tolerances specified in Section 51-1.17, "Finishing Bridge Decks."

39-7 MISCELLANEOUS

39-7.01 Miscellaneous Areas.—Surfacing of miscellaneous areas, such as median areas (exclusive of inside shoulders), island areas, sidewalks, dikes, gutters, gutter flares, ditches, overside drains, aprons at the ends of drainage structures, and other areas outside the traveled way which are designated on the plans as miscellaneous areas to be paved with asphalt concrete, shall conform to these specifications.

The combined aggregate grading for asphalt concrete placed on miscellaneous areas shall conform to that specified for the asphalt concrete placed on the traveled way, unless otherwise directed by the Engineer. The amount of asphalt binder used in the asphalt concrete placed in dikes, gutters, gutter flares, overside drains and aprons at the ends of drainage structures, unless otherwise directed by the Engineer, shall be increased one percent by weight of the aggregate over the amount of asphalt binder used in the asphalt concrete placed on the traveled way.

The asphalt concrete placed in miscellaneous areas may be spread in one layer. The material shall be compacted to the required lines, grades



SCALE: 1" = 5' HORIZONTAL
1" = 1' VERTICAL

SECTION B-B
(BASE FAILURE)

FIELD BOOK	DATE	1989 STREET RESURFACING PROJECT	APPROVED: _____ 19__	SCALE:
PAGE		TYPICAL SECTION	ENGINEER _____ R.E. NO. _____	DWG. NO.
DRAWN JT	2/89	CITY OF PALM BEACH, CALIFORNIA	REVISION:	FILE NO.
CHECKED				



APPENDIX G5

BIKES IN THE FREEZER

The San Francisco Bicycle Coalition presents

Bikes in the Freezer

**a comprehensive solution
to the problem of urban bike theft**

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Executive Summary	1
plan	
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Executive Summary

The San Francisco Bicycle Coalition (SFBC) calls for a comprehensive, three-point approach to end the scourge of bicycle theft. Our approach combines cyclist education, infrastructure changes, and law enforcement changes, and utilizes the various strengths of business, government, and advocacy groups.

The key elements of our plan are:

- **education:** teaching cyclists our novel ***Freezer Registration***, a new way to record & retain serial numbers, how to secure their bikes, and to be wary of purchasing stolen goods
- **infrastructure:** improving bike parking city-wide
- **enforcement:** providing police up-to-date info on bikes reported stolen, assuring that police take advantage of existing databases of stolen bikes, and getting more bike-based police to guard against muggers who attack people for their bikes

Funding for this plan will come from diverse sources:

- education will be provided by advocacy and industry groups
- infrastructure changes qualify for local, state and federal funds
- improved use of existing police resources will actually save money

The overall cost will be low — our plan will, in fact, save taxpayers money. We call for no new taxes or bureaucracies. Rather than attempting to keep records of every bike in the city or state, police are asked only to keep track of stolen bikes. Cyclists retain primary responsibility for registration and security of their bikes. We believe that our plan is San Francisco's best hope for reducing bike theft.

Who we are: The San Francisco Bicycle Coalition is a 22-year-old advocacy organization dedicated to promoting the bicycle for everyday transportation. Some issues we have been involved with have been securing bike access to the Golden Gate Bridge and CalTrain, and the current redesign of Valencia Street to make it safer for bicycles.

Reach us at 415 431-BIKE, 1095 Market Street #215, San Francisco, CA 94103, or on the Internet at SFBike@igc.org.

Introduction

The San Francisco Bicycle Coalition (SFBC) is deeply concerned with the problem of bicycle theft. Theft is a major obstacle in the path to a bikeable city, where cheap, accessible, enjoyable transportation is available for all. Stories abound of people who have given up bicycling following a theft.

Meanwhile, violence seems to be on the rise in bike thefts. Increasing numbers of cyclists report being physically attacked for their bicycles. These problems represent a grave danger to urban cyclists individually, and to urban cycling as a healthy form of transportation.

The causes of theft are complex, and so must be any solution. Today, we hear calls for the police to “do something” about theft, but proposals presented so far have been devoid of complexity. While the police aim to respond to bike theft by requiring registration of new bikes, this solution only grasps at one small part of the problem, and poorly at that.

The SFBC calls for a comprehensive, three-point approach to end the scourge of bicycle theft. Our approach combines cyclist education, infrastructure changes, and law enforcement changes, and utilizes the various strengths of dealers, advocacy groups, legislators, security-oriented businesses, and law enforcers. (See Appendix A)

The key elements of our plan are:

- education: teaching cyclists how to record & retain serial numbers, how to secure their bikes, and to be wary of purchasing stolen goods
- infrastructure: improving bike parking city-wide
- enforcement: providing police up-to-date info on bikes reported stolen, while assuring that police take advantage of existing databases of stolen bikes

Funding for this plan will come from diverse sources:

- education will be provided by advocacy and industry groups
- infrastructure changes qualify for state and federal funds
- more efficient use of existing databases will save money

For a more detailed breakdown of funding, see Appendix B.

None of our proposals require substantial expenditures. This is remarkable, especially when compared to other anti-crime plans. Indeed, our plan will save taxpayers money. We believe that our plan is San Francisco's best hope for reducing bike theft.

Cyclist education – decentralized security

Education is the most cost-effective means to policy implementation. Rather than further overworking police to crack down on thieves, cyclists can learn to avoid buying stolen bikes. Rather than building new bureaucracies for registration, cyclists can learn how to record and retain information about their own bikes. Bicycle advocacy groups are already demonstrating that they will take the lead in providing education. Because education costs much less than any other tactic for both registration and cutting the stolen bike market, this tactic is our highest priority.

Self-registration: The Freezer

Theory: Mandatory bicycle registration has government and industry doing something for a fee, which cyclists can already do for free. Since every bike has a serial number stamped onto it, it is easy for cyclists to keep track of their own bikes.

Problem: Most people are lax about writing down their serial numbers. Even responsible people have trouble finding such information in crisis times, like immediately after a burglary. To make pre-theft registration easier, the National Bike Registry (NBR) charges \$5 to \$25 to keep track of cyclists' names, addresses, and bike serial numbers. However, they charge money, and their least expensive registration expires in twelve months.

Solution: The SFBC is already publicizing a method for cyclists to keep track of their own serial numbers. The "registration system" we call for is simple: it is called **Freezer Registration**. Cyclists write down a description of their bikes, along with the bike's serial number, and put the description in a bottle in their freezer. We produce Freezer Forms (see Appendix C) to make sure all pertinent information is recorded. We already have Public Service Announcements (PSAs) under production. Within ten years, this sort of self-registration could be as universal and predictable as Medic-Alert bracelets.

Action Plan: Local advocacy groups will print simple forms for people to use — a preliminary one is included with this plan. Stores will hand out such forms with every new bike purchase. Advocacy groups, schools, and police departments will provide such forms at bike-oriented public events. The SFBC will produce posters and PSAs publicizing *Freezer Registration*.

Materials will be produced for a variety of media, including radio, magazine, and newspaper, initially using San Francisco's three major languages: English, Spanish, and Cantonese. Other languages can easily follow.

Funding: The only costs this plan incurs are the cost of producing Freezer Forms and the cost of publicizing *Freezer Registration*. These expenses will be easily covered by local and state bike advocacy groups.

Cyclist education (continued)

Cutting the stolen bike market

Theory: Bikes won't get stolen much once nobody buys stolen bikes. Theft is largely driven by economics — professional thieves are not popping locks for fun or transportation. In order to eliminate a business, one must eliminate its customers. Luckily, many cyclists would rather not buy stolen bikes.

This demand-side approach makes citizens responsible for crime prevention, rather than further taxing overworked police forces. The bike theft business will almost certainly be slashed when people are more hesitant about buying the merchandise.

Problem: Nobody is getting this message out to the public.

Solution: Bike groups and companies will fill this role. An ethic of “Don't support thieves - they'll get you next” will be conveyed through a publicity campaign. The same campaign will instruct potential buyers of stolen bikes to check with a police officer, to make sure the bike they are buying is not hot. The officer will check CLETS, and the bike buyer will be able to know whether the bike was reported stolen. More information on CLETS is on page 8, **Law Enforcement**.

Action plan: Advocacy groups and security products companies will produce a set of educational posters convincing people to check out the bikes they buy. These will be posted in bike shops, flea markets, and high-crime areas.

Here in San Francisco, every mobile police unit has direct access to the CLETS database, which is intended by law to track every reported stolen bike in the state. Potential stolen bike customers will know to ask police officers to check out questionable bikes on the database. All anyone will need is the bike's serial number.

Funding: Posters, costing only cents apiece, can be paid for by individual fund-raising initiatives by local and state-wide bike groups. Bike shops and other industry members have a lot to gain from cutting bike theft, and may be willing to contribute money to the effort.

Cyclist education (continued)

How and where to secure a steed

Theory: Well-secured bikes won't be ripped off as much.

Problem: Many cyclists don't secure their bikes well.

Solution: They can be taught how, where, and why to secure their bikes well.

Action Plan: Bike advocacy groups, with bike security products companies, will produce posters, PSAs, and commercials instructing cyclists of all ages, genders, ethnicities, and languages in how, where, and why to secure bikes well.

Materials will be produced for a variety of media, including radio, magazine, and newspaper, initially using San Francisco's three major languages: English, Spanish, and Cantonese. Other languages can easily follow.

Funding: Because some of the information will promote locks and racks, security products companies may help pay for the wide distribution of this campaign. Actual production will be managed by bike advocacy groups, who will also provide some funds for publication and distribution. The campaign will be inexpensive, as it will rely largely on donated media space.

Infrastructure – secure* parking for all

Theory: A well-locked or indoor bike is harder to steal than one that's outdoors, locked to itself, or unlocked. The harder theft is to accomplish, the less theft there is likely to be.

Problem: Bicycles, when stolen, are often ill-secured, due to the lack of solid locking posts and restrictive bike access policies. The City of San Francisco has actually started a program to provide subsidized racks to businesses, but there has been no publicity, and the legal restrictions on the racks make them quite unsavory. As a result, in the program's first year, 1993, only one bike rack was installed. Another impediment to on-street bike parking is the law, which prohibits bike racks on several downtown blocks.

For long-term parking, many residences and businesses provide nothing at all. Increasing numbers of commercial parking lots allow bikes, but the service is neither uniform nor well-publicized. All San Francisco buildings required to supply auto parking are required to provide bicycle parking, but cyclists are rarely informed of the service.

At some office buildings, leases exclude cyclists from bringing bikes into offices, even when safe indoor storage spaces exist.

At public events, there is often no bike parking at all. Many, such as ball games and street fairs, by nature require cyclists to leave their bikes out of sight for hours. The bikes are then easy prey for thieves.

Solution: Cyclists need public bike racks for short-term parking and indoor access to public buildings for long-term parking. This is as true at home as at work.

Action Plan: The City will immediately enhance its program for distributing subsidized bike racks. In the interest of bike theft reduction, the City will, on its own, locate areas that need more bike racks and install them. Location, density, and design guidance will be provided by the Department of Parking and Traffic's Comprehensive Bicycle Plan, which is now under production. Bike parking will be provided like bus stops or fire hydrants: ubiquitous, accessible, and free.

City law will change from prohibiting bike racks to encouraging them in congested downtown areas. Where sidewalks are too crowded, they will be widened to provide the room necessary for bicycle parking.

(continued on following page)

* For more information on what the SFBC considers "Secure," see Appendix D.

(Infrastructure: Secure Parking for All, continued)

To more strongly encourage bike facilities, building codes will require that any home or business place, in order to change hands, be equipped with a secure bicycle parking facility. Further, lease restrictions barring bicycles from office buildings will be abolished by local ordinance.

All parking lots will have protected bicycle parking, which will be well-publicized for tourists and natives alike. The SFBC is now designing a pilot program for the California Academy of Sciences, to demonstrate the feasibility of guarded parking for high-traffic spots.

The City will eventually need to make parking uniform. As of January 1, 1999, the City will make bike parking standards uniform, whether or not buildings have changed hands. As of then, the City will grant itself the right to install bike parking at any building where parking is inadequate.

Funding: Transportation enhancement money is available for bike parking; the City need only apply. Chicago, for example, has funded a massive bike rack program through Federal Congestion Management and Air Quality (CMAQ) money from the Intermodal Surface Transportation and Efficiency Act (ISTEA). According to the Surface Transportation and Policy Project (STPP), a Washington transportation think tank, CMAQ money has gone largely unspent for the past three years. This leaves plenty of money available for a low-cost project like bike parking.

Law enforcement

Police database

Theory: To complement the programs sketched above, cyclists need an effective police database to track stolen bikes by serial number. Stolen bike tracking is vital both for victims of theft and for potential stolen bike buyers.

Problem: The police have a state-wide stolen goods tracking system, known as the California Law Enforcement Tracking System. It is accessible from every station and mobile unit of the San Francisco Police Department. State law (Penal Code Section 11111) mandates that all stolen bicycles be entered into the system. However, police are never instructed in this mandate, and most stolen bikes are not entered in the system. Coverage of stolen bikes is spotty enough that most police officers do not check CLETS when recovering possibly stolen cycles.

Solution: Current law must be followed. All stolen bikes are to be entered into CLETS.

Action Plan: Any police officer to enter a stolen bike into the system, and to find out at any time whether a recovered bike has been reported stolen. Police will be instructed as to their responsibilities under PC 11111. With CLETS fully utilized, it will become routine for bikes involved in crimes to be checked out. Increased police vigilance over parked bikes will cut into theft, as well. They will make an effort to learn and beware of bike thieves' trendy tricks.

Further, potential buyers of stolen bikes will be alerted to the existence of CLETS. A publicity campaign will instruct potential stolen bike buyers to check with a police officer before purchasing a potentially stolen bike. By checking the CLETS database, customers will be able to buy used bikes with clean consciences, and some bike thieves will, doubtless, be caught.

Funding: This proposal will actually save police money. By fully utilizing CLETS, which already exists, more bikes will be promptly returned to their owners, saving the police warehousing costs. The police department will also be able to reduce officer time spent on today's contorted, paper-based stolen bike tracking system. CLETS is paid for and officers are already trained in its use. No new hardware, training, or administration is needed.

Law enforcement (continued)

Stopping bike muggings

- Theory:** When people fear being attacked for their bikes, they are less likely to ride. Fear grows more acutely in members of groups regularly victimized in our society: women, recent immigrants, people of color, and the poor. These are the same people who benefit most from the low cost, independence, and great convenience of riding bikes.
- Problem:** Bike muggings seem to be on the rise. Anecdotal stories have begun to flourish – where muggings were once conducted by obnoxious youths in desperately poor neighborhoods, recent attacks have moved to main streets, and have apparently involved professional thieves. Some thefts have been at gunpoint.
- Solution:** This is an area where armed law-enforcement professionals have a major role to play. Regular bike patrols will help, as will “sting” operations.
- Action plan:** Bicycle-based patrols will become the norm in all parts of the city. Cops on bikes will notice what is happening to cyclists more they would from cars or on foot.
- We suspect that sting operations, in which plainclothes officers ride through problem areas supported by regular police, could also have an effect in deterring bike muggings.
- Funding:** Bike-based patrols cost considerably less per officer than car-based patrols, saving taxpayers money. While sting operations are expensive, they will not be heavily used. Current staff will be able to cover this demand.

Appendix A: Roles for all

This proposal throws a wide net. We hope to include everyone who can be included in the broad, but rather simple, ending of the bike theft plague. We want bicycle retailers, advocacy groups, local and state legislatures, local and state police forces, and bike security-related businesses to all take part in ending bike theft. We intend our proposal to benefit the whole cycling community as much as possible, without unfairly taxing or profiting any segment.

Bicycle dealers will take part in the education aspect of the plan. They will display posters, give out self-registration forms, and otherwise explain to people how to go about registering and, if necessary, recovering, bicycles. They can, if they want, add a further layer of registration upon the self-registration. Some stores already keep a database of serial numbers of every bike they sell, along with the customers' name. Continuing this system will help back up the self-registration system we propose.

As a similar backup, the **National Bike Registry** can continue to offer its service to all bike owners. It will remain as valuable as it is today.

Advocacy groups will certainly be in the forefront of education to encourage people to self-register their bikes. Indeed, the advocacy community already provides pamphlets on the subject; self-registration forms and educational posters are already under production. Advocacy groups will also be expected to contribute expertise for bike parking standards and some funding for the startup costs of *Freezer Registration*.

Bike products companies will be able to take part in the educational campaigns. Some companies will help underwrite poster production in return for advertisement space. But most importantly, they will continue to produce diverse, high-quality security products to make thieves feckless.

Legislators have a handful of tasks assigned to them by this proposal. Local or state legislators can impose bicycle parking restrictions on new construction, as SB-833, now under suspense in the California Assembly's Ways and Means Committee, attempts to do. Local legislators are to develop bicycle parking standards, and place them in the building code. They are also to legalize lease requirements on commercial property which exclude bicycle parking in offices.

The Department of Parking and Traffic will identify necessary parking places. The DPT's Comprehensive Bicycle Plan will provide standards for bike parking density, location, and design.

Law enforcement officials will apply the standard, already written into law, that every stolen bike goes into CLETS. Further, it will be helpful for them to make CLETS accessible for potential buyers of used goods. Locally, police officers, on bikes, can more actively patrol high-theft areas, while departments begin sting operations against bike muggers.

Appendix B: Financing against bike theft

Funding for		Will come from
Education:	Freezer Registration	Advocacy groups, commercial sponsors; revenue-conserving compared to other registration systems
	Cutting the market	Legitimate dealers, advocacy groups; is revenue-conserving if it reduces need for street-level law enforcement
Infrastructure	Short-term parking	Federal CMAQ funds, state gas tax money, local sales tax (Transportation Authority) funds; revenue-conserving if it reduces auto use & congestion
	Long-term parking	Building owners/users, possibly subsidized by same sources as short-term parking
Law Enforcement	Uniform CLETS use	Revenue-conserving
	Bike patrols	Revenue-conserving

Appendix C: The Freezer Form

Record information here

Serial Number:

Brand of bike: _____

Model: _____

Size: Frame: _____ Wheel: _____

Color(s): _____

Year: _____

Number of gears: _____

Circle one choice in the following entries:

Type of bike: Mountain Road Recumbent
Tandem Cruiser Cargo 3-speed
BMX Other _____

Handlebar: Straight Dropped Moustache
Sprint Other _____

Brakes: Hand Foot

Special identifying marks & characteristics,
trick parts, strange anodizations...

**and freeze until
needed.**

Appendix D: Secure bike parking

Minimum security needs

Long-term parking: If a bike needs to stay somewhere longer than five minutes, the only guaranteed security is Body Part Locking. That is, one must be in contact with one's bike at all times. While not unheard of, such a method is difficult at the movies, while sleeping, and during intimate moments. Thus, many homes and businesses have developed long-term bike parking that is indoors, preferably within a secure area, and out of view from outside. In this parking area, one must be able to lock a bike just as well as if it were on the street. Some bike racks, exposed plumbing, and solid fencing all work well as tethering posts.

Short-term parking: People must be able to run errands by bike without spending inordinate time seeking parking. Adequate outdoor parking is any solidly planted metal object around which the locks of the day can fit and which discourages the theft methods of the day. That's vague, but security needs change. For the past fifteen years, the most often-used short-term parking spot has been the parking meter. Any bike rack should imitate the meter's success by being strong, well-planted, made of hardened metal, and two to three inches across with an inviolable head.

Event parking: Simple coat-check systems such as the SFBC's bike parking system work. The SFBC has now parked several thousand bikes without a theft. Event parking requires a high level of security and visibility, to ward off organized or armed robbers.

Location

Whenever possible, short-term parking should be highly visible from within the building or event it services.

If sidewalks are so congested that new bike parking will inconvenience pedestrians or wheelchair users, sidewalks should be widened.

Density

Bike parking should be provided well in excess of demand. It is clear from the European and Japanese experiences, as well as from the US experience with cars, that capacity invites users. Since cycling is good for the urban environment as well as for global ecology, it should be encouraged. Excess capacity should also be provided because peak loads should be within capacity. There should never be times when cyclists are forced to leave bikes unsecured.

Appendix E: Implementation Timetable

Right Away: to be completed in 1994

Education

Freezer Registration enters public eye through PSAs, SFBC outreach
Fund-raising for and production of "How & where to lock" and "Don't buy stolen bikes"

Infrastructure

City applies for federal and state money for infrastructure
City Bicycle Plan identifies locations for bike racks
Indoor bike parking standards for offices and industrial sites passed
Public parking lots required to install protected bike parking
Pilot project at California Academy of Science

Law Enforcement

Police start using CLETS to check bicycle serial numbers
Bike-based stings begin against muggers

Soon: 1995-98

Education

Freezer Registration publicized in schools, bike safety fairs, and in mass media
Bike parking publicity for tourists & natives
"How & where to lock" and "Don't buy stolen bikes" education produced and released in various media
Checking with police to confirm used bikes' status becomes commonplace
Cyclists, more conscious of how to secure bikes, cut theft and pressure businesses to allow bikes indoors

Infrastructure

Commercial parking lots required to supply and publicize bicycle parking
Secure bike parking required at all public events
DPW installs bike racks at locations identified in Bicycle Plan
Uniform bike parking standards pass into law
Commercial leases may no longer exclude bicycles from buildings

Law Enforcement

More police get onto bikes
Stolen bike inquiry line installed at Police Department
Proper CLETS use becomes standard statewide

Long-term: 1999 onward

Freezer Registration becomes as commonplace as Medic-Alert
City installs bike parking, indoors and out, at every unserved building
Bike theft is no longer a deterrent to cycling in San Francisco!!



APPENDIX G6 BIBLIOGRAPHY

Bibliography of Potential Materials for In-House Training of City Planners and Engineers

Transportation Research Board (in-print publications)

- ▶ *Bicycling and Bicycle Facilities Research Problem Statements*, 26 pp, 1988, CIRC 337
- ▶ *Pedestrian and Bicycle Planning with Safety Considerations*, 45 pp, 1987, TRR 1141
- ▶ *Driver Performance, Pedestrian Planning, and Bicycle Facilities*, 91 pp, 1988, TRR 1168
- ▶ *Non-Motorized Transportation*, 1992, LP-262

Building a Better Bike Path: Trails as Transportation

Victoria A. Eisen

Compendium of Papers, ITE District 6, 47th Annual Meeting 1994

Bicycle Traffic Engineering - What Every Traffic Engineer Should Know

Michelle M. DeRobertis, P.E.

Carol R. Levine

Compendium of Papers, ITE 64th Annual Meeting, October 1994

Bike Lanes versus Wide Curb Lanes: Applications and Observations

Kevin St. Jacques, P.E.

Michelle M. DeRobertis, P.E.

Presented at ITE 64th Annual Meeting - October 1994

Liability Aspects of Bicycle Environments: Bicycle Facilities and Roads

Alex Sorton

Tom Walsh

John Williams

Compendium of Papers, ITE, 60th Annual Meeting, 1990

A Primer in Bicycle Transportation

P. Heppleston, City of Edmonton, Alberta, Canada

Compendium of Papers, ITE District 7 Annual Meeting, 1993



APPENDIX H EDUCATION AND ENFORCEMENT

Road Sharing Brochures

Don't be a Road Warrior

Don't be a Bubbasaurus

League of American Bicyclists

Sample Questions for Driver's Tests

Walnut Creek Police Department

Sample Letter for Child Bicycle Violators

Bicycle Enforcement Video "The Law's for All"

DON'T BE A ROAD HOG!

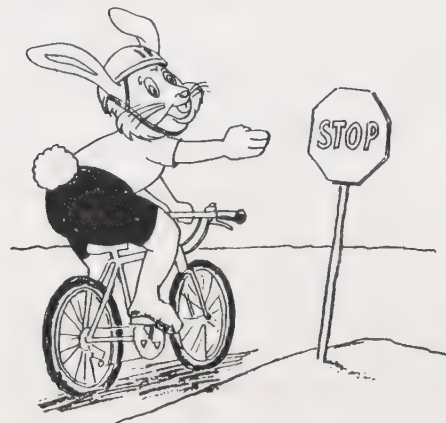


When you ride your bike in traffic, you are a driver. Wear your bike helmet - it could save your life, and it's state law if you're under 16. Don't hit the road without a helmet.

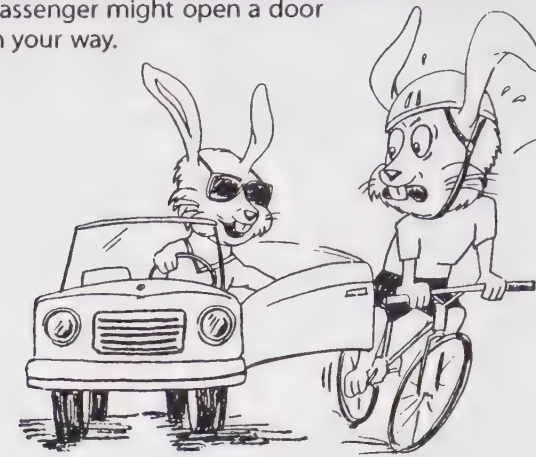
The Bicyclist's Responsibility

Always follow the rules of the road. Stop at all stop signs, and obey traffic lights, too -- you are a driver now!

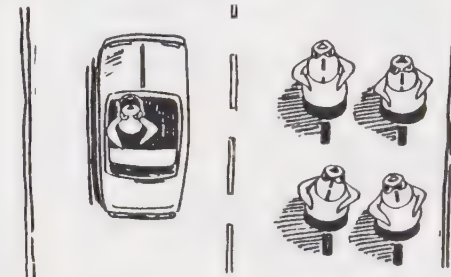
Ride RIGHT - with traffic, and to the right side of your lane. Always look back, signal, and check for traffic before you make any turn, even a right-hand turn. When entering a roadway, look left, right, then left again.



Pedestrians get to go first. Yield the right of way, and keep a sharp lookout for drivers near you, just as other drivers do. Allow four feet between you and parked cars. A driver or passenger might open a door in your way.



If you ride with your buddies, don't hog the road. Two riding side by side is the limit, but ride single file whenever cars or trucks are around. Be courteous to other traffic.



Check your brakes, and make sure your handlebars don't wobble and your tires have enough air -- every time you ride.

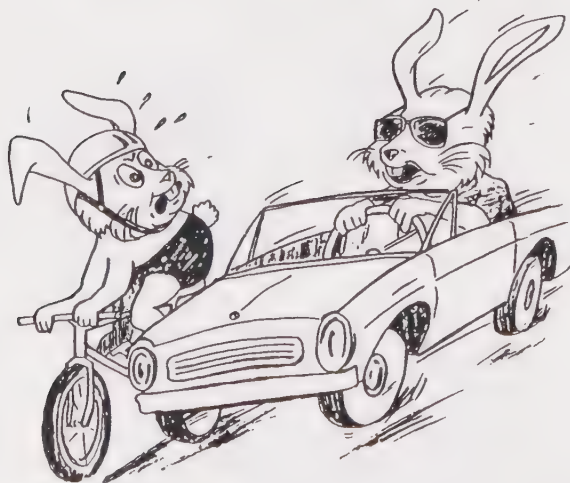
If you ride after dark, be safe -- BE SEEN. Georgia Law requires your bicycle to be equipped with a white light in front and a red reflector in the rear, each visible from a distance of 300 feet. (A red rear flashing light is great!) Light, colored clothing with reflective patches and reflective wheel strips also help you be seen.

Sidewalks are made for walking, not biking. A motorist leaving a driveway doesn't expect you to speed down the sidewalk across their path. If you use a sidewalk, be extra careful every time you cross a driveway, or leave the sidewalk to enter the road.



SHARE THE ROAD!

DON'T BE A ROAD WARRIOR



SHARE THE ROAD!

Roads are made for traveling, and bicycles belong on the roads as much as motor vehicles. Bicyclists may not be the fastest road users, but under Georgia law, bicycles are recognized as vehicles, and have a right to use the road. Every user should recognize this right and drive courteously.

Did you know:

Bicyclists are required to ride as far to the right in the roadway as practicable, exercising due care when passing or being passed in the same direction.

However, bicyclists typically must leave the right-hand side when:

- A cyclist is overtaking and passing another vehicle proceeding in the same direction.
- A cyclist is preparing for a left turn at an intersection or onto a driveway.
- There are unsafe conditions by the curb, such as parked vehicles, pedestrians, animals, potholes, or debris.

When a bicyclist is changing lanes to make a left turn, for example, he or she follows the same path any other vehicle would take traveling the same direction.

Bicycles are a legitimate mode of transportation, not toys! They are pollution free, and put no measurable wear and tear on our roadways. That means lower maintenance costs to Georgia taxpayers -- and because bicycles are smaller, there's less congestion, too.

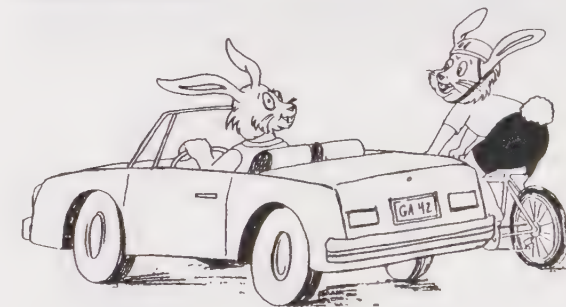
Sidewalks are made for walking, not biking! Don't expect bicyclists to use them instead of the road, since sidewalks are made only for pedestrians, and are inadequate as bikeways. Share the road with cyclists instead!

Cycling isn't dangerous, at least no more so than driving, if you obey traffic laws and ride visibly and predictably, according to the League of American Bicyclists. Actually, the regular workout gives cyclists healthier and longer lives than those who do not exercise.

The Motorist's Responsibility

Pass cyclists with care. Give them plenty of room. Look ahead when you drive; plan and anticipate passing bicyclists quickly and efficiently. If the roadway isn't clear for passing, be patient, and wait until it's safe to pass. Respect their right to use the road.

Save your horn. Honking because you see a bicyclist on the roadway is not a permitted use of the horn. Some bicyclists are startled by honking; using it improperly could cause a serious accident.



Let's keep Georgia Peachy Clean...for everyone. Bicyclists need a clean, smooth surface. Glass and other trash forces bicyclists away from the right side. Keep it clean, and there'll be more room for us all.

This brochure was prepared with support of the Governor's Office of Energy Resources (OER) and the Georgia Department of Natural Resources (DNR), with funds made available under an oil overcharge court settlement and within the guidelines of the U.S. Department of Energy (DOE) grant to the Southern Bicycle League, Georgia's largest bicycle club. However, any opinions, findings, conclusions or recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of DOE, OER, or DNR.

For more copies of this brochure or a "Share the Road" bumper sticker, send a S.A.S.E. to: Southern Bicycle League, P.O. Box 1360, Roswell, GA 30077.

For more information about the state bicycle program, or maps of Georgia counties, contact Georgia Department of Transportation, #2 Capitol Square, Atlanta GA 30334, or call (404) 656-5267.

Artwork, "Share the Road" logo, and design by Mark Dodson

PRINTED ON RECYCLED PAPER

DON'T BE A BUBBASAURUS!



SHARE THE ROADS!

To report drunk drivers or hazardous traffic conditions call

800/525-5555

Motorized vehicles aren't the only vehicles allowed on the road. Bicycles belong there, too. Bicyclists may not be the fastest road users, but by Texas law, they have a right to share the road. Motorists must recognize this right, and drive courteously. Did you know:

• **Bicyclists are required to ride as far right in the lane as possible only when the lane can be safely shared by a car and a bicycle, side by side.** Even then, there are certain conditions that allow a bicyclist to take the full lane, such as:

- the person is overtaking and passing another vehicle proceeding in the same direction.
- the person is preparing for a left turn at an intersection or onto a private road or driveway.
- there are unsafe conditions in the roadway, such as fixed or moving objects, parked or moving vehicles, pedestrians, animals, potholes, or debris.
- the lane is of substandard width, making it unsafe for a car and a bike to safely share the lane side by side. When this is the case, it's best for the cyclist to take the full lane.

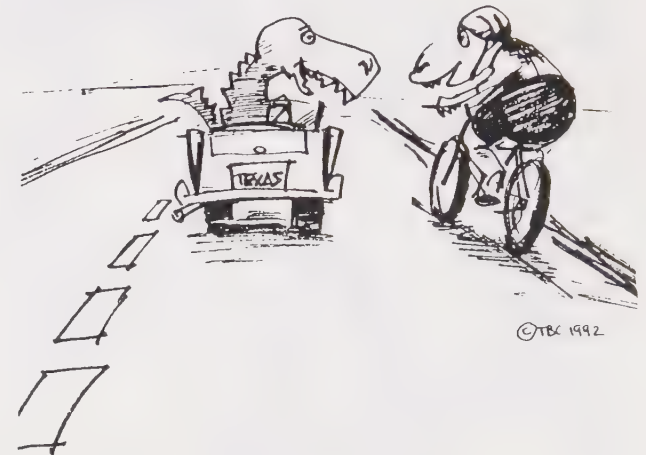
• **Bicyclists aren't restricted to the right lane of traffic.** One way, multi-laned streets are one example. Another instance is when the bicyclist is changing lanes to make a left turn. They are to follow the same path any other vehicle would take traveling the same direction.

Bicycles are an alternate mode of transportation. Not only are they pollution free, but they also put no measureable wear and tear on our roadways. That means a lower maintenance cost to Texas taxpayers. Bicycles aren't just a toy anymore.

THE MOTORIST'S RESPONSIBILITY:

Pass cyclists with care. Give them plenty of room. Look ahead when you drive, plan and anticipate passing bicyclists quickly and efficiently. If the roadway isn't clear for passing, be patient, and wait until it's safe to pass.

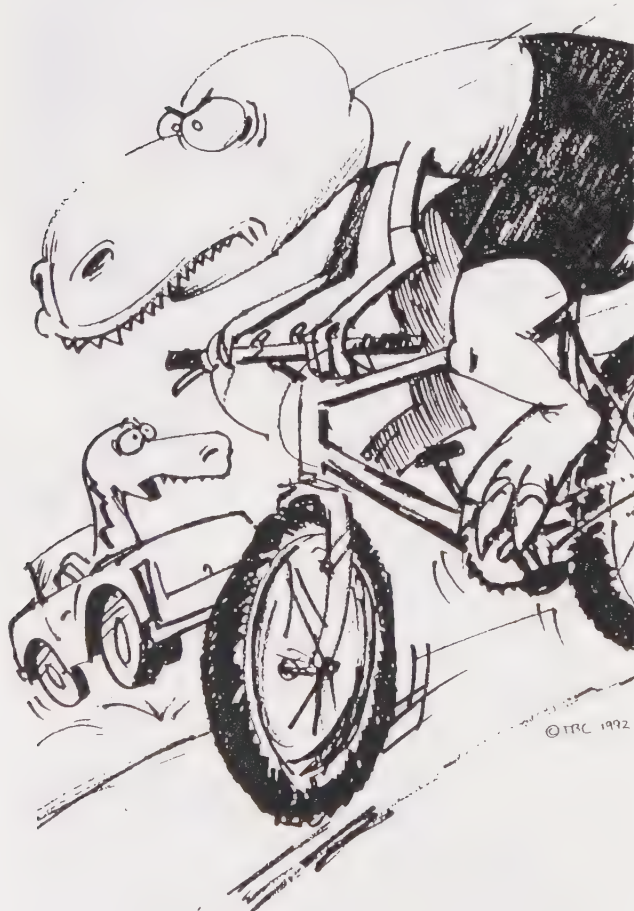
Save your horn. Honking because there is a bicyclist traveling on the roadway is not a permitted use of the horn. Imagine what it would sound like out on the street if everyone honked at every vehicle passed! Some bicyclists are startled by honking. Using it improperly could cause a serious accident. Don't be a Bubbasaurus. Think ahead.



Don't mess with Texas! Keep our roadways clean . . . for everyone. Bicyclists can only use a clean, smooth shoulder. Throw trash there and they'll be forced to take the lane. Keep it clean, and they'll take the shoulder when possible.

Produced by the Texas Department of Transportation and the Texas Department of Public Safety. Prepared by the Texas Bicycle Coalition, PO Box 1121, Austin, TX 78767.

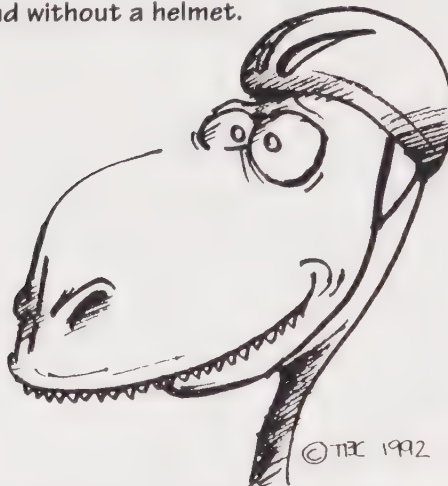
DON'T BE A BEASTOSAURUS!



SHARE THE
ROADS!

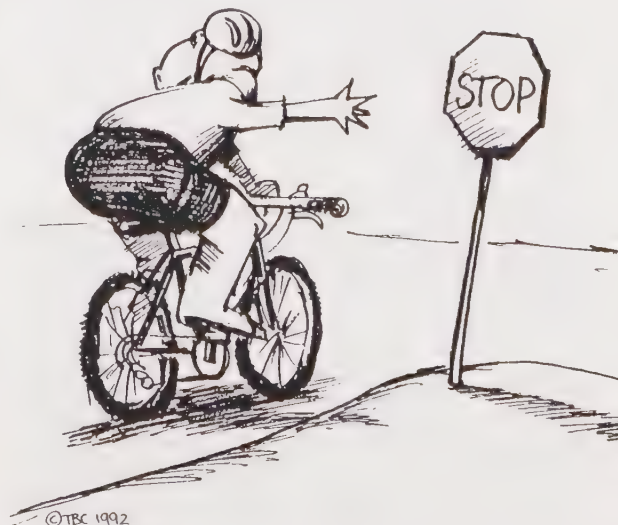
SA-50 (4/92)

When you ride your bike in traffic, you are a driver. **Wear your "crash helmet."** A bike helmet could save your life. **Don't hit the road without a helmet.**



Always follow the rules of the road.

Ride **RIGHT** - with the traffic, to the right side of your lane. Always look back, signal, check for traffic before you make any turn or leave your driveway. Otherwise, you may become extinct! Stop at **all** stop signs and lights, too. You are a driver now!



Pedestrians get to go first. Yield the right of way, and keep a sharp lookout for danger in every direction at all times - just like car drivers do. Allow four feet between you and parked cars. A careless driver could be opening a door in your path!



If you ride with your buddies, don't hog the road. Two side by side is the limit. If the lane can be safely shared with a car, the law is "single file." Be courteous to faster traffic. Don't cause a traffic jam. Let them pass when it's safe, but hold your lane.



Make sure your vehicle works the way it should. Check your brakes, tire pressure, and make sure the handlebars don't wobble - every time you ride.

If you must ride when it's dark, be safe - **BE SEEN.** Texas law requires your vehicle to have a white light in front and red light or reflector in back. Light colored clothing with reflective patches and reflective wheel strips also help you be seen.



LEAGUE OF AMERICAN BICYCLISTS

SAMPLE QUESTIONS FOR DRIVER'S TESTS

True/False Format:

Bicyclists have the same rights and responsibilities as other drivers when using the road. True

If there are no other vehicles present, a bicyclist does not need to obey traffic signs. False

A bicyclist should ride as close to parked cars as possible to avoid getting too far out in the lane. False

The law requires bicyclists to use a front headlamp when riding at night, at dawn, at dusk, and other low light conditions. Although those may not be the exact words, the statement is basically true for all states.

Multiple Choice Format:

A bicyclist must obey all laws applicable to:

- a. pedestrians
- b. operators of motor vehicles
- c. operators of slow moving vehicles
- d. none of the above

In (state), a bicycle (or the operator) is classified as a:

- a. Pedestrian who must use the sidewalk.
- b. Toy to be used in the backyard.
- c. Vehicle, whose driver has the same rights and responsibilities as drivers of other vehicles.

There is a bike path alongside the roadway, yet there is a bicyclist in front of you using the road instead of the path. You should:

- a. Honk at the cyclist and point to the path.
- b. Notify a policeman.
- c. Treat the bicyclist as you would any other vehicle, since a bicyclist is allowed to use either the roadway or the bike path. (This question cannot be used in states with a mandatory sidepath law.)



RECEIVED
NOV - 9 1994
WILBUR SMITH ASSOCIATES

POLICE DEPARTMENT

(510) 943-5844

November 7, 1994

Wilber Smith Associates
Attn: Ms. DeRobertes
360 22nd St. Suite 600
Oakland, CA 94612

Dear Ms. DeRobertes,

Enclosed please find a copy of the letter we send to children who receive bicycle citations. Also enclosed is a copy of the bicycle safety information we send home with the letter.

This information was requested by Will Patterson of your office. Please feel free to call me if I can be of further service.

Sincerely,

A handwritten signature in cursive script, appearing to read "R. Bartlett".

Richard S. Bartlett
Police Sergeant

Dear Parent:

Enclosed herewith is a duplicate of a bicycle "citation" issued to your child for a violation of the Walnut Creek Bicycle Ordinance, or for a section of the California Vehicle code relating to the operation of bicycles. It will NOT be necessary for your child to appear on this matter. Instead, we are taking this opportunity to bring to your attention the violation of those sections indicated, so that you might instruct your child accordingly on the safe operation of his or her bicycle.

It is most important that bicycle riders be aware of the laws and regulations that govern riding bicycles. All of these sections have been created specifically for the safety of the rider. The safety and well-being of all our citizens is our primary concern, and to this end your Police Department asks your assistance in educating your child on the necessity for observing the safety rules and regulations concerning bicycle operation.

To assist you in this effort, we are enclosing a copy of these ordinances and state laws, and have also included a small pamphlet that may be useful in checking over the mechanical condition of the bicycle, and in reviewing the basic safety rules for safe operation. Information is also supplied on the procedure for obtaining a bicycle license.

The recent popularity of bicycle riding is certainly understandable. It is an economical and enjoyable means of transportation, and with care, can be a safe method as well. Unfortunately, we have also had a like increase in vehicular traffic, and the hazards posed to the bicycle rider are far greater now than only several years ago. For this reason, we urge your cooperation and assistance in teaching your child the importance of these rules and laws, so as to avoid as much as possible an unfortunate confrontation between his or her bicycle and an automobile.

Very truly yours,

KAREL A SWANSON
Chief of Police

BY:

Commander, Traffic Bureau

Enclosures

A. OBTAIN A BICYCLE LICENSE

You must have a State of California bicycle license to ride your bicycle within the city limits of Walnut Creek.

It is important to have a license for two reasons:

First, if you are injured as a result of an accident, or become lost or confused, the Police will be able to get in touch with your parents within minutes.

Secondly, a license will increase your chances of getting your bicycle back if it is ever lost or stolen.

B. TO OBTAIN A LICENSE

1. Request a registration form from the Walnut Creek Police Department. The request may be made by mail, telephone or in person.

2. Mail or bring in the completed registration form with the license fee on THURSDAYS between 4-8PM; or SATURDAYS from 10a.m. - 2 p.m., to:

Walnut Creek Police Department
1666 N. Main Street
Walnut Creek 94596

Bicycle licenses cost \$3.50 and are valid for three years.

Bicycle licenses can be renewed for \$3.00.

C. LOCK YOUR BICYCLE AT ALL TIMES

Lock bicycle to a bicycle rack or pole whenever you can.

D. PUT YOUR BICYCLE AWAY AT NIGHT

Do not leave your bicycle on sidewalks or in a driveway. Put your bicycle in the back yard or garage.

WCPD 261
Rev. 9/22/81

City		Zip Code	
Home Phone		School	
Bicycle Mfr	Model	Type	Color
Wheel Size	Frame Size	Date Iss	Date Expires
New Owner's Name		Fee Paid	
Address		Phone	
Seller's Signature		Date	
MISCELLANEOUS INFORMATION			

SAMPLE OF BICYCLE REGISTRATION: OWNER OF OWNERSHIP

CALIFORNIA
BICYCLE LICENSE APPLICATION

BICYCLE RULES OF THE ROAD

① **DRIVE ON THE RIGHT-HANDEDGE**

② **OBEY ALL TRAFFIC RULES**
(just like other drivers)

③ **GIVE HAND SIGNALS**
(to show what you're going to do)

④ **ALWAYS RIDE SINGLE**

An extra person makes it harder to balance, see, steer and stop.

⑤ **AVOID CROWDED AND HIGH-SPEED ROADS**

Bikes are prohibited from most highways. Use bike paths when possible.

⑥ **PROVIDE YOUR OWN POWER**

Never hitch on to a truck, car or bus. It's a good way to get hurt.

⑦ **LOOK OUT FOR PEDESTRIANS**
(people who are walking)

⑧ **KEEP HANDS ON HANDLEBARS**
(except when signaling)

⑨ **TRAVEL SINGLE FILE**
(when you're driving with a group)

⑩ **WALK YOUR BIKE**
across curbs and busy intersections.

What's a question?
What's a "bike". is a
a TWO-WHEELED
BICYCLE? PEOPLE-HELPER

WALNUT CREEK POLICE DEPARTMENT BICYCLE SAFETY PROGRAM

PROTECTION

For YOU and your BICYCLE

WALNUT CREEK
POLICE DEPARTMENT



Before long you will want to drive an automobile. The habits you develop now as a bicycle rider, will be carried over into your driving. Make a point to learn and obey the "rules of the road." They are designed for your SAFETY.

Remember . . .
a good driver never takes chances!

For SAFETY . . .
follow these facts . . .

MECHANICAL PROTECTION

BICYCLE SAFETY INSPECTION

BE SURE YOUR BICYCLE IS THE PROPER SIZE AND IT IS SAFE TO RIDE.

MAKE A SAFETY CHECK OF YOUR BICYCLE AND EQUIPMENT.

NOTE: Use information chart for checking.

	O.K.	REPAIR, REPLACE OR ADJUST
1. Handle bar grips		
2. Saddle		
3. Wheels		
4. Reflector		
5. Brakes		
6. Chain		
7. Chain Guard		
8. Pedals		
9. Crank Handles		
10. Tire Valves		
11. Tires		
12. Spokes		
13. Light		
14. Fork bearings		
15. Handle bars		
16. Horn or Bell		
17. Lock & Chain		
18. Carrier-Basket		
19. Kickstand		
20. License		

MAKE A SAFETY CHECK ONCE A WEEK

HANDLE GRIPS Replace worn handle grips. Cement them on tightly.

SADDLE Adjust to body and tighten all nuts.

WHEELS Estimate wheel true. Tighten wheel nuts and oil bearings.

REFLECTOR Must be visible for 300 feet.

COASTER BRAKE Does it brake evenly? Unless you're an expert, have it adjusted by a serviceman.

CHAIN Check for damaged links. Secure snug fit. Clean and lubricate frequently.

PEDALS Lubricate and tighten pedal bearings and spindle. Replace worn pedal treads.

CRANK HANGER Keep clean and greased. If it wobbles, have serviceman make adjustments.

BELL OR HORN Be sure it works properly.

HANDLE BARS Adjust to body. Tighten and keep stem well down in fork.

FORK BEARINGS Lubricate.

LIGHT Must be visible for 500 feet.

SPOKES Replace broken ones promptly.

TIRES Inflate to correct air pressure. Remove imbedded metal, glass, cinders, etc.

TIRE VALVE Inspect often for leaks.



SAFETY RULES

1. Ride in single file on the right side of the street, close to the curb or in bike lane if marked. NEVER RIDE AGAINST TRAFFIC.
2. Do not ride on sidewalks. When STREETS ARE CROWDED, push bike on sidewalk.
3. LOOK and SIGNAL before turning or stopping, same as auto drivers. DO NOT WEAVE BACK and FORTH.
4. STOP and LOOK out for other traffic at all stop signs, and when coming out of a driveway or alley. OBEY TRAFFIC SIGNAL LIGHTS.
5. DO NOT speed or race your bike on the street or sidewalk.
6. DO NOT stunt or try fancy riding on the street or sidewalk.
7. NEVER allow a car or motorcycle to tow you on your bike. NEVER HANG ONTO CARS OR TRUCKS.
8. Don't carry passengers except on a separate seat attached. WALK YOUR BICYCLE ACROSS MAJOR STREETS, not controlled by signs or signals.
9. DO NOT carry bundles in your arms while riding your bicycle. USE A BASKET OR CARRIER.
10. Always park your bicycle locked in a safe place, in a rack or against a building. Never in front of a doorway or in the middle of the sidewalk.

ACCIDENT PROTECTION

A. LEARN TO RIDE SAFELY.

Practice riding where there are no cars or people. DO NOT PRACTICE IN STREETS.

B. LEARN AND OBEY TRAFFIC RULES.

Bicycle riders must obey traffic rules and regulations the same as automobile drivers.

OBSERVE ALL TRAFFIC LAWS



Always use proper hand signals.



LEFT TURN

STOP

RIGHT TURN



LEAGUE OF AMERICAN BICYCLISTS

January 6, 1995

RECEIVED
JAN - 5 1995
WILBUR SMITH ASSOCIATES

Michelle DeRobertis
WSA
360 22nd St., Suite 600
Oakland, CA 94612

Dear Michelle,

Thank you for requesting information on the video "The Law's For All", and we would like to apologize for the delay in responding to your inquiry. The video is now available for distribution, and we are pleased to make it available to you at a cost of \$14.95 plus \$3.25 shipping and handling.

"The Law's For All" is an informative teaching tool that conveys the importance of enforcing traffic laws equally on bicyclists and motorists. In addition to the video, you will receive 50 copies of the enclosed brochure. If you anticipate needing more brochures, we welcome you to photocopy those provided. L.A.B. will also provide additional brochures at a cost of \$5/100 or camera ready slicks for \$10/set. Quantity discounts are available to advocacy organizations and law enforcement agencies.

"The Law's For All" video and brochure are distributed exclusively through the League of Michigan Bicyclist and L.A.B. and may be ordered by calling toll free 1-800-288-BIKE or sending a check to L.A.B. We appreciate your patience in this matter and look forward to continuing to advance your bicycling needs.

Sincerely,

John Reich
Assistant Education Director



**"LAW'S FOR ALL" VIDEO
ORDER FORM**

ORDER TOLL FREE

1-800-288-BIKE

L.A.B.

190 W. Ostend St., Suite 120

Baltimore, MD 21230-3755

Name _____

Address _____

City _____ State _____ Zip _____

Daytime Phone #(____) _____

Evening Phone #(____) _____

___ Check/Money Order ___ Visa/MasterCard

Acct. # _____ Exp. _____

Signature _____

Number of "Law's For All" videos _____ x \$14.95 = _____

MD residents add 5% sales tax _____

Shipping & Handling # of videos _____ x \$3.25 = _____

Total _____

If you are a tax-exempt organization, please provide us with a
copy of your tax-exempt certificate.



APPENDIX I

FINDINGS OF THE EMPLOYEE BIKE-COMMUTE PROMOTION PROGRAMS SURVEY

FINDINGS OF THE EMPLOYEE BIKE-COMMUTE PROMOTION PROGRAMS SURVEY

Company: Taligent, Inc
Address: Cupertino, CA
Contact: Lee Collins (lee_collins@taligent.com)

1. What incentives are being offered?

All employees have flex time. There are also lockers, showers, towel service, and a safe bicycle room inside both of our buildings. We also have a fleet of company bikes for commuting between our two buildings and for local shopping etc. The facilities people regularly post bike and other alternative transport information to the company-wide electronic bulletin board.

2. How successful they have been?

I don't have exact numbers, but at I would guess up to about 10% of the employees regularly commute by bike. The bike storage rooms tend to be filled to capacity when the weather is good.

3. How many employees?

About 300 Employees

Company: Wright Patterson AFB near Dayton, Ohio
Contact: Chuck Smith
chksmith@wpdis01.wpafb.af.mil

1. What incentives are being offered?

will be installing 8 bike lockers for commuters
Publishes bike commuting miles for individual commuters in Dayton Cycling Club newsletter. Lists riders and their miles in the column.

2. How successful they have been?

Number of commuters sending their miles has grown to about 30. Logging close to 30,000 miles in 94.

3. How many employees?

roughly 20,000 civilian and military employees on base.

Company: Alza Corporation
Address: Palo Alto, CA
Contact: Joanne Rogers, Benefits Dept 415/494-5177

1. What incentives are being offered?

Locked Bicycle parking room; showers; \$1 per day for alternative commute modes including bicycle commuting to make the transit subsidy more equitable

2. How successful they have been?

Very few bicycle commuters

3. How many employees?

800

Company: Adobe Systems
Address: Mountain View, CA
Contact: John Cicccarelli, volunteer bicycle coordinator, jciccare@mv.us.adobe.com
Roxanne Rasmussen, commute coord 415-962-3979

1. What incentives are being offered?

a) Inside bicycle parking, with a formal posted policy approved by Facilities and Security departments and by the city's fire department. Bikes may be parked in employee-entrance stairwells and in offices and cubicles if there is sufficient space.

b) Bike parking stands in bike-parking stairwell areas. These are simple floor stands as used for bike display in bike shops; they keep the inside parking areas organized.

c) Free lunch coupon for first-time bike commuters

d) Showers in all buildings, in shower/locker rooms connected to bathrooms. These were installed when the building was built; Adobe did not add them.

e) Day-use clothes lockers (unfortunately, no permanent use is allowed, though several buildings have a surplus of such lockers).

f) Flex time- Adobe is a software company; the corporate culture includes an unwritten policy of fairly flexible hours as long as you get the job done.

2. How successful they have been?

I'd say maybe 1% to 2% bike commute during daylight savings time, but that's only a guess. Contact Roxanne Rasmussen, our commute coordinator, at 415-962-3979 for details (she probably has the survey results but has not published them).

3. How many employees?

About 900 at the 5-building Mountain View site. About 1400 worldwide

Company: City of Menlo Park
Contact: Debby Helming, TSM Coordinator
415/858-3363

1. What incentives are being offered?

\$1 per day for bicycle commuting (and car pooling) to make the transit subsidy more equitable; 6 bicycle lockers available on as needed basis; shower facilities adjacent to City Hall; Employees are able to bring bicycles into offices if room; bike racks outdoors.

2. How successful they have been?

Most significant increase in alternative commuting is bicycling 2.4% in 1991; 3.1% now.

3. How many employees?

25,000 citywide

Company: Hewlett-Packard
Contact: Linda Haddock, 415/857-2266

1. What incentives are being offered?

Bike repair stations with repair equipment at work sites; Bicycle Lockers (more than 140); Showers & Clothing lockers; Bimonthly newsletter

2. How successful they have been?

Waiting list for bicycle lockers

3. How many employees?

15,000 employees

Company: Stanford University, Palo Alto
Contact: Jeff Tumlin, 415/723-9362
Jeffrey.tumlin@forsythe.stanford.edu

1. What incentives are being offered?

Clothing lockers; Showers; \$70 voucher good at campus bike shop or for daily parking if employee does not buy parking permit; Allowed to bring bikes in offices if room; FUTURE-Getting full time bike coordinator soon; bike racks for few thousand bikes; Bike garages (to protect bikes from weather and theft) for students and employees; Exploring ways to equalize subsidy by university between cost of providing car parking and subsidies to other mode commuters.

2. How successful they have been?

21% employees bike-commute; 58% of students & staff walk & bike; 35% drive.

3. How many employees?

15,000-students; 1,600-faculty; 9,000-staff; 5,400-various; 31,000-total

Company: Palo Alto Medical Foundation
Contact: Dena Mossar, 415/853-4794

1. What incentives are being offered?

Discount at 2 bikes shops

2. How successful they have been?

Not available

3. How many employees?

Not Available

Company: Apple Computer
Contact: Scott Haywood (408) 862 7059

1. What incentives are being offered?

\$1 day for using alternative commute mode including bicycling; Bicycle lockers at most locations (total about 100); 2-4 fleet bikes at most bldgs for use during the day; Showers and commute information centers in most bldgs; bicycle club of employees

2. How successful they have been?

40 lockers are checked out

3. How many employees?

Not available

Company: City of Palo Alto
Contact: Kathy Lee, Commute Coordinator
(kathy_lee@city.palo-alto.ca.us), 415/329-2582.

1. What incentives are being offered?

Employer-owned bikes to loan for trial bike commuting (4 bikes); \$20 vouchers for 3 local bike shops for commuters (commute 60% of working days-12 days month); rack in visible location in parking garage; locked bike cage at City Hall for employees; buddy bike rider program; bicycle route information for commuting; \$.07/mile for use of private bike to conduct authorized city business.

2. How successful they have been?

33 registered in program; about 10 hardcore commuters

3. How many employees?

930 citywide

Company: Fleetwood Enterprises (RV manufacturers)
Address: Riverside, CA
Contact: Roberta Holden, 714/351-3987

1. What incentives are being offered?

Fitness Center with showers; 50 bicycle lockers; fleet of 24 company bikes you can use for up to 60 days and

purchase at a discount if you agree to commute min of 3 times/week; safety package of helmet, reflective vest and headlamp for regular commuters; on-site repair facilities; company-supplied bike map showing best routes to work; shuttle service for stranded riders; company policy for forgiving lateness caused by cycling.

2. How successful they have been?

10-12% bike-commute regularly

3. How many employees?

650 at Riverside headquarters

Source: *Bicycling*, December 1994.

Company: B.C. Systems Corporation

Contact: Suzie Ross, Environment Coordinator (604)

389-3053 Fax (604) 360 7007

e-mail: SCROSS@BCSC02.GOV.BC.CA

1. What incentives are being offered?

Lockers

2. How successful they have been?

Not available

3. How many employees?

Not available

Company: Tandem Computers (computer company)

Address: Cupertino, CA

Contact: Nick Yatsko (408) 285-0012

1. What incentives are being offered?

Showers & clothing lockers;

Bike lockers at every bldg (total of 50);

Company-paid membership in REI's Commuter Club-entitles rider to discount and free tune-ups and regular workplace visits by REI mechanic; brochures and books on riding techniques and safety; lunchtime and evening repair and riding classes; Bike-to-Work Day includes breakfast, prizes, cycling seminars and maintenance evaluations.

2. How successful they have been?

8% on Bike-to-Work Day; 2% regularly

3. How many employees?

3,200 in Cupertino

Source: *Bicycling*, December 1994.

Company: Silicon Graphics (computer company)

Address: Mountain View

1. What incentives are being offered?

Showers in almost all 18 bldgs; 120-plus bike lockers and getting more; 75 company-owned bikes for inter-bldg trips; bike map; guaranteed company-paid taxi ride home for emergencies; Annual Bike-to-Work Day includes breakfast, water bottles and prize drawing.

2. How successful they have been?

1% bike-commute regularly

3. How many employees?

2,800 in Mountain View HQ

Source: *Bicycling*, December 1994.

Company: Sun Microsystems (computer and software)

Address: Palo Alto, CA

Contact: Alan Aranha

1. What incentives are being offered?

Showers & lockers; Parking for 40 bikes in "bike corral"-fenced-in building with card-key access; Plans for new "bike corral" for 80 bikes.

2. How successful they have been?

1-2% bike-commute regularly

3. How many employees?

6,500 in 5 Bay Area locations

Source: *Bicycling*, December 1994.

Company: Intel

Contact: Linda Griffin (408) 765-8080

1. What incentives are being offered?

Enclosed covered bike racks

Showers

E-mail network for bicyclists

Printed bicycle info literature

Bicycle events/get togethers (brown bag lunch speakers)

2. How successful they have been?

Not available

3. How many employees?

Not available

Company: National Center for Atmospheric Research
(federally funded scientific research organization)
Address: Boulder, CO

1. What incentives are being offered?

Shuttle vans with bike racks every half-hour between 2 sites, Downtown and University of Colorado; Showers & clothes lockers at both sites; Coin-operated (quarter is returned) bike lockers; Newsletter; Info on bus routes via E-mail; Bike-to-Work Day; Transportation Coordinator supplies bike info to new employees; Participant in GO Boulder (city-run transportation program); President of governing body is bike commuter.

2. How successful they have been?

150 bike-commuters at last Bike-to-Work Day despite rain

3. How many employees?

1,200

Source: *Bicycling*, December 1994.

Company: Walker, Richer & Quin Inc. (computer software company)
Address: Seattle, WA

1. What incentives are being offered?

Asked bike-commuters input when building new facility; 2-bike storage rooms with racks and card-key access; showers & clothes lockers; company partner is regular bike-commuter; bike route maps posted; cycling info on e-mail; strong pro bike-commute company.

2. How successful they have been?

10%

3. How many employees?

350

Source: *Bicycling*, December 1994.

Company: Genentech
Address: South San Francisco
Contact: Rich Booth, ETC Program Manager (415) 225-2409

1. What incentives are being offered?

12 bicycle lockers; showers. Future consideration-Commuter credits for alternative modes; access to company along abandoned railroad r-o-w.

2. How successful they have been?

Lockers always being used; 1% bike commute

3. How many employees?

3000

Company: University of California at Davis
Address: Davis, CA

1. What incentives are being offered?

Bike program since 1980; Bike lockers and showers for out-of-town commuters; Commuting map; Bike cop and student bike patrol; Bike-traffic school to reduce fines; On-campus bike shop (accommodates do-it-yourselfers with tools and repair stands); Discount bus coupons for non-pedal days; Lock cutting service; Education program.

2. How successful they have been?

25% of employees bike-commute; 55% of students; 15,000-18,000 bikes on campus each day.

3. How many employees?

9,462 employees; 22,000 students

Source: *Bicycling*, December 1994.

Company: NIKE (athletic shoe and sportswear company)
Address: Beaverton, OR

1. What incentives are being offered?

Covered, locked bike storage; showers & clothes lockers; \$1 credit at company store and cafeteria for each day you pedal, run, skate or carpool to work; regular lunch rides

2. How successful they have been?

Not available

3. How many employees?

2,000 in Beaverton HQ

Source: *Bicycling*, December 1994.

Company: Honeywell Satellite System Operations (hardware and software for space flight)
Address: Glendale, AZ

1. What incentives are being offered?

Showers and clothes lockers; Covered bike parking; Free cab ride home in emergencies; \$0.25/day for bike-commute; Eligible for monthly gift certificates up to \$100 from local stores; Proposed Adopt-a-Bike-Lane program for road leading to worksite; Bike-to-Work Day including gifts and cash for participants.

2. How successful they have been?

5% regular bike-commuters

3. How many employees?

800

Source: *Bicycling*, December 1994.

Company: REI (outdoor equipment-retail and mail order)

Address: Seattle, WA plus 41 stores nationwide

1. What incentives are being offered?

Employee bike racks and showers at many stores; Bi-monthly bike-commute day with free breakfast and e-mail recognition; annual Bike-to-Work promotion in October.

2. How successful they have been?

10% bike-commute regularly

3. How many employees?

4,200 at all stores

Source: *Bicycling*, December 1994.

Company: Lawrence Livermore National Laboratory

Address: Livermore, CA

1. What incentives are being offered?

Fleet of 750 company-owned bikes

2. How successful they have been?

Not available

3. How many employees?

Not available

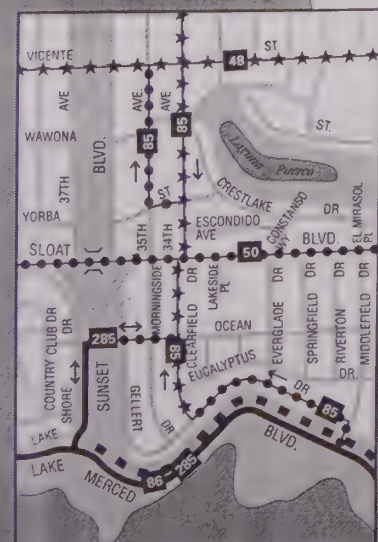
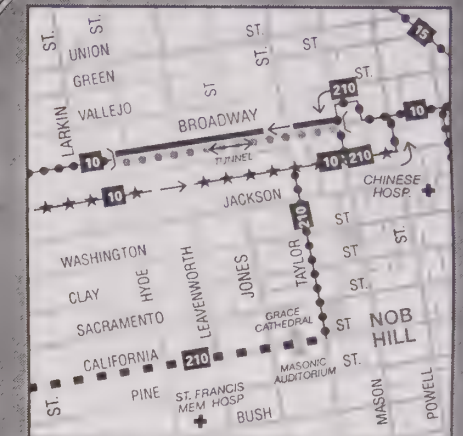
Source: *Bicycling*, December 1994.

RECOMMENDED BIKE ROUTES

- Signed Route (no street changes)
- Wide Curb Lane
- Bike Lane
- Bike Path
- Traffic Calming/Bike Priority Street (BPS)
- Locations that require major capital improvements or policy changes

RECOMMENDED BICYCLE NETWORK

Wilbur Smith Associates
Stevens Associates
May 1995



RECOMMENDED BIKE ROUTES

- Proposed Scenic Bike Route
- Proposed S.F. Bay Trail
- Proposed Bay Area Ridge Bicycle Trail
- Pacific Coast Trail
- 5% - 10% grade
- 11% - 18% grade

RECOMMENDED SCENIC BICYCLE ROUTE

Wilbur Smith Associates
Stevens Associates
May 1995



RECOMMENDED BIKE ROUTES

- Class I Path (offstreet)
- Bike Learning Route

RECOMMENDED FAMILY/CHILDREN'S BIKE AREAS

Wilbur Smith Associates
Stevens Associates
May 1995





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